

FLIGHT

The
AIRCRAFT
ENGINEER
&
AIRSHIPS

First Aero Weekly in the World

Founder and Editor: STANLEY SPOONER

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport

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DIARY OF FORTHCOMING EVENTS.

Club Secretaries and others desirous of announcing the date of important fixtures are invited to send particulars for inclusion in the following list:

Nov.	Entrance Examination for R.A.F. College.
Nov. 7-15 ..	Olympia Motor Car Show.
Dec. 3	"The Air Force." Lecture by Air-Commodore H. R. Brooke-Popham before R.U.S.I.
Dec. 19 to ...	Paris Aero Show.
Jan. 4, 1920.	

EDITORIAL COMMENT

DURING the railway strike the Post Office made a somewhat half-hearted attempt at an inland aerial mail service. It is true that the strike very fortunately lasted only a little more than a week, and that there was thus none too much time at the disposal of the postal authorities for proper organisation, and to that extent they are entitled to the benefit of the doubt. We said as much at the time,

but it is impossible to regard what happened then and the position as it is now with anything approaching satisfaction. We can pass over the apparent lack of enterprise shown by the Post Office as being due to the causes we have stated, viz., the lightning character of the strike and the shortness of its duration, but there is nothing in this to account for the general lack of interest, to use no harder term, in the development of the carriage of mails by the air.

It seems to be fairly clear that the Post Office cannot have given anything like close study to the question of aerial mail-carrying. The absurd charge demanded during the strike—two shillings per ounce for letters—is sufficient proof that it has not gone closely into the costs of aerial carriage, else it would have known that mails can be conveyed by aeroplane to anywhere in the British Isles for sixpence per ounce and still show an all-round margin of profit. To demand such extraordinary rates as the first is simply to kill the traffic before it has begun. Major C. C. Turner, writing in last Sunday's *Observer*, gives some very interesting figures relative to costs which he has obtained from a number of experts. The figures all relate to multi-engined machines, which are costly to run, but have been selected because of their real or supposed greater reliability than the single-engined type. It is possible, by the way, that the success of the London-Paris service, which is being conducted by single-engined machines, may lead to a modification of the theory. The estimates range from £1 to £2 per ton per mile, so that it is safe to take a mean figure, which is what the writer does for the sake of pointing his argument. One of these mean estimates gives the figure of £1 11s. 8d. per ton per mile, allowing for all overhead and establishment charges and providing for a profit of 30 per cent. A 300 miles' journey, then, would cost £470, but the machine would carry a sufficient weight of mail to bring in a revenue of £1,250 at 6d. per ounce! Another estimate puts the cost, inclusive of all charges whatsoever, at £1 9s. 4d. per ton per mile. On this basis it would cost 1s. 3d. to carry one pound 100 miles, 13s. 1d. to carry one pound for 1,000 miles and £65 10s. to carry 100 pounds for 1,000 miles. On this basis, assuming 20 letters to weigh 1 lb., the postage per letter for 1,000 miles would be

about 7d. And yet for journeys of not more than 350 miles the Post Office asks for 2s. per ounce. Obviously, it is not a commercial proposition at all, and until the Post Office is prepared to talk commercial sense, instead of simply making a shot at its charges and placing the latter on a profiteering basis, it is obvious that there will be no development in the aerial carriage of inland mails.

Why Make a Profit At All?

Being convinced that the aerial carriage of mails can be worked on a sound commercial basis, showing an advantage in speed of delivery to the community and enabling the Post Office to recoup itself, we are not advocating the subsidising of aircraft for the purpose. The figures quoted by the *Observer* contributor are on all fours with other estimates to which we have had access, and we accept them as being quite sufficiently near the mark to answer for all practical purposes. That being so, there is not the slightest doubt the Post Office could run its mail services on the basis of 6d. per ounce and show a considerable margin of profit. But even if there were a slight loss on such services—in the early days during the working up to paying load there would naturally be a loss—we should still say that it is the business of the Post Office to accept the loss and inaugurate a comprehensive series of mail services. We need not argue the case from our own point of view or that of the aircraft industry. We have had it from almost every member of the Government that it is essential, even vital, that aviation should be encouraged by every possible means, and that the Government intends so to encourage it. We have been told, time and again, that it is absolutely necessary that we should be always in a state of aerial preparedness for any eventuality that may befall. Therefore, the matter is better argued from the point of view of national preparedness at all times and in every season. Having been told all these things, we naturally look towards the Government to see exactly what measure of support and encouragement is likely to be forthcoming. All sorts of schemes have been in the air, from a frank subsidisation of the industry to the inauguration of State-owned mail and passenger services, but they all remain very much in the air, if the expression may be allowed to pass. There has been a great deal of talk, but precious little real encouragement.

Why should the Post Office, being a department of the Government which has urged that aviation must be encouraged, look initially to the making of inflated profits on any aerial mail services it may run? Does it want a new and prolific source of revenue to balance the alleged loss on the telephones? Seriously, we think that even though it were faced with a certain loss on the first few months' trading, until such time as the commercial community had got used to the idea of aerial mails, it is the bounden duty of the Post Office to set about the organisation of aerial mail services to supplement other methods of transport, which, as we have seen recently, are liable to sudden and complete stoppages, and to give to the commercial community the added facilities for the transmission of urgent correspondence which aircraft have placed at our disposal. The argument is all the stronger because there is every reason for believing that there need be no loss—under competent management—but a substantial profit—and not at 2s. per ounce—after the services had been well

established and the confidence of the public gained. In any case, there must be a certain amount of risk about all new enterprises, and while we do not expect a Government department to accept, as a general rule, the same risks as a commercial undertaking, the case of aviation is an exceptional one in which not only is the taking of the risk justifiable but essential in the best interests of the nation.

A Landmark in Aviation

Last week saw the completion of the first six weeks of the London-Paris aerial passenger service. The figures are more than a little interesting, especially having regard to the discussion now taking place on account of the apparent unwillingness of the postal authorities to commit themselves to the use of the aeroplane as a mail carrier. These statistics show that of 86 scheduled flights, 83 were successfully accomplished. Of the three which were not completed, one was prevented altogether by weather, one was interrupted by weather conditions, and the remaining one was interrupted by a mechanical defect. The number of miles flown was 20,750, at an average speed of 106 miles an hour, the 250 miles journey between the two capitals having been accomplished in an average time of 2½ hours.

There is very little need to elaborate the figures, which speak far more eloquently for themselves than we could. They must appeal to the man in the street most powerfully, as demonstrating that the aeroplane has indeed arrived at a stage of reliability at which it can be trusted to carry out its work with very nearly the same practical certainty as any other form of transport. Moreover, it is a safe form of transport on the showing of the London-Paris service, since there has not been a single accident to machine or passengers with the exception of one forced landing through a slight mechanical defect, and that only involved delay. It is not as though the opening of the service had been blessed with fine weather and calm atmospheres. On the contrary, the weather conditions generally have been unstable, and there has been at least one storm of exceptional severity when, in spite of a wind velocity of over a hundred miles an hour, the Paris to London service was duly carried out, though the flight in the other direction had to be abandoned. Against this may be noted that at times the service has had to be duplicated. On the whole, therefore, we think we are justified in calling attention to the success of the service as a veritable landmark in the history of aviation. That success augurs very well indeed for that of future enterprises of a like nature, and, incidentally, it may be hoped that the Postmaster-General will take due note of the facts.

The R.A.F. and Economy

Sir William Joynson-Hicks, in a letter to *The Times*, urges the need for immediate and drastic cutting down of national expenditure, and pleads for a civilian head to determine policy and consequent expenditure in each of the great spending departments of State. He takes the R.A.F. as his text, and seems to be on good ground when he says:—

"No one will accuse me of belittling this force or of denying the need of an adequate and highly trained force in the future, but are the military heads to get to work on a basis of a £60,000,000 expenditure, or a £25,000,000 expenditure, or a £10,000,000 expenditure? Do not forget that Gen. Trenchard is a soldier; his immediate superior, Gen. Seely, is a soldier; and his superior, Gen. Churchill, is—well, a super-soldier. All three are imbued with the principle,

Flight—And the Men



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Lieut.-Col. T. O'B. HUBBARD, who was in charge of the Martlesham Heath Experimental Station of the Air Ministry, Technical Department

good in war but fatal in peace, 'Get the thing done and never mind the cost.' May I again press upon the Government the appointment of a Parliamentary Committee to examine, in consultation with the General Staff, the needs of the Air Service and the possibilities of the Exchequer, with power to fix—subject, of course, to the Cabinet—first the nature of the new Air Force, and, secondly, the total amount that can be allotted to it?"

On general principles we agree with the views thus expressed, but we fear this is a thorny and a controversial subject. In the past, especially during the War, the cry has been always for experts to run the fighting Services. The man in the street has wanted to know why a politician and not a sailor has been at the head of the Board of Admiralty, and why we should be content with a political War Minister when there were available distinguished and able soldiers capable of running the business of preparing for and making war. Equally the argument extends to the R.A.F., and on grounds of efficiency it might be asked whether the three distinguished names quoted by Sir William are not those of men better qualified to run the R.A.F. than the best politician of them all. In any case, as we understand the position, General Trenchard has been told most categorically that the maximum amount to be spent annually on the services of the Air Ministry is £25,000,000, and that he must cut his coat accordingly. Of course, it might be reassuring to the public that such a Parliamentary Committee as that suggested should be appointed to make sure that the £25,000,000 is the minimum required, and that it is being spent wisely. We are not, however, particularly enamoured of Parliamentary Committees of the kind. They usually spend a lot of time, not only their own, which does not matter particularly, but that of a number of officers and officials who are taken from their proper tasks to compile masses of information and to give evidence before the Committee—time which could be far more usefully employed. In the end, they make a report to Parliament, which is read and promptly forgotten.

What we should like to know about the allocation of the £25,000,000 is exactly what proportion is to be devoted to civil aviation, and we shall look anxiously forward next year to the detailed estimates for the information. It is fairly generally agreed that for the present we shall do better to cut down on the active list of the R.A.F. and go in for a policy of encouragement of civil aviation in such a way as to build up an adequate and efficient flying reserve which would be at the disposal of the Air Ministry in case of national emergency. The arguments *pro* and *con.* for this policy have been set forth in the columns of FLIGHT on several previous occasions, so we do not propose to traverse them again now. It appears to us to be the best line of policy to be adopted in the circumstances, but the Air Ministry seems to be chary of taking the public into its confidence, and if Sir William will press for a statement on policy in the course of the debate on economy which is sure to take place when Parliament meets next week, we had rather see that than any controversy about the appointment of a purely civilian head of the R.A.F.

**The R.A.F.
as a
Profession**

The Air Ministry has recently issued a booklet containing the regulations for the R.A.F. Cadet College. In the main, they closely follow those governing Sandhurst and the R.M.A., the objects of the college

being precisely similar in their scope. The limits of age for admission to the college are from 17½ to 19, with the exception of those who are actually serving, or have served, in the forces and are recommended by their C.O. for a permanent commission in the R.A.F., in which case the age limit is twenty-one.

The subjects for the entrance examination which are obligatory are English, English history and geography, elementary mathematics and one modern language. Optional subjects are Latin, Greek, another modern language, mathematics (elementary, intermediate and higher), science, and elementary engineering. All the obligatory subjects must be taken, but not more than three of the optional. Incidentally, we had begun to think that the fetish of the dead languages had almost departed, but it does not seem to be so. How much better a flying officer the candidate is likely to make if he passes high in Greek than as though he were unable to differentiate between ϕ and θ is one of those things which are possibly only known to those who drafted the syllabus.

Candidates will be expected to qualify by obtaining not less than 33 per cent. of marks in the four obligatory subjects. They will receive extra marks if they hold Certificate A from an O.T.C., or if they have served in the senior division of the O.T.C., or if they have completed four months' continuous service as officers, warrant or non-commissioned officers or in the ranks in the Services. A certain number of prize cadetships will be awarded to successful competitors in order of merit, carrying certain emoluments and financial benefits. These are designed to give assistance to those who stand in need of the emoluments attached to them. There will also be King's cadets appointed by the Secretary of State, and honorary King's cadets nominated by the Secretary of State, and a limited number of cadetships will occasionally be filled by suitable candidates specially nominated by the Air Council, such recommendations being submitted by the candidates' head masters.

The course of study at the College during the first year will include:

English literature and language, the British Empire, practical mathematics (including mechanics and draughtsmanship), general elementary science, history of the R.A.F., outline of Army and Navy organisation and characteristics of the various arms and types of ships, map-reading, R.A.F. law and administration, drill (with rifles) and physical training, hygiene and sanitation, practical work in the workshops, the Morse code, passenger flying, with instruction in map-reading and use of compass and machine-gun.

During the second year the course will be:

Theoretical and practical instruction in engines, including magnetos and their management, theory of flight, practical rigging, advanced work in wood and metal workshops, wireless telegraphy and telephony, machine and Lewis gun, instruction in aviation.

There is nothing remarkable in the conditions. They are, as we have already remarked, practically identical with those of the Army training colleges.

The main point is that they definitely mark the establishment of the R.A.F. as a separate and distinct Service, self-contained and self-centred in the same manner as the Navy and the Army.

LORD FISHER AND AIRCRAFT

It was always recognised that Lord Fisher was a strong disciple of aviation, and the "disclosures" which he makes on Wednesday last in his "Memories," now appearing in *The Times*, are corroborative of this air-belief and of a distinctly interesting character. The reference of Lord Fisher to the importance of aircraft in the War is as follows:—

"Somewhere about January 15, 1915, I submitted my resignation as First Sea Lord to Mr. Churchill because of the supineness manifested by the High Authorities as regards aircraft; and I then prophesied then raids over London in particular, and all over England, that by and by caused several millions sterling of damage and an infinite fright.

"I refer to my resignation on the aircraft question with some fear and trembling of denials; however, I have a copy of my letter, so it's all right. I withdrew my resignation at the request of Authority, because Authority said that the War Office and not the Admiralty were responsible and would be held responsible. The aircraft belonged to the War Office; why on earth couldn't I mind my own business? I didn't want the Admiralty building and our wireless on the roof of it to be bombed; so it was my business (the War Office was as safe as a church, the Germans would never bomb that establishment!).

"Recently I ventured to meet Mr. Holt Thomas, and he brought to my recollection what was quite a famous meeting at the Admiralty. Soon after I became First Sea Lord on October 31, 1914, I had called together at the Admiralty a great company of all interested in the air; for at that moment I had fully satisfied myself that small airships with a speed of 50 miles an hour would be of inestimable value against submarines and also for scouting purposes near the coast. *So they proved.*

"Mr. Holt Thomas was a valued witness before the Royal Commission on oil and oil engines, of which I was chairman (a sad business for me financially; I only possessed a few hundred pounds and I put it into oil—I had to sell them out, of course, on becoming Chairman of the Oil Commission—and what I put these few hundreds into caused a disappearance of most of these hundreds, and when I emerged from the Royal Commission the oil shares had more than quintupled in value and gone up twenty times what they were when I first put in).

"Through Mr. Holt Thomas we obtained the very important evidence of the French inventor of the Gnome engine—that wonderful engine that really made aeroplanes what they now are. His evidence was of peculiar value; and so also was that of Mr. Holt Thomas's experience; and the result of the Admiralty meeting on aircraft was that we obtained from Mr. Holt Thomas an airship in a few weeks, when the experience hitherto had been that it took years; and a great number of this type of aircraft were used with immense advantage in the War. I remember so well that the very least time that could be promised with every effort and unstinted money was three months (but Mr. Holt Thomas gave a shorter time). In three weeks an airship was flying over the Admiralty at 50 miles an hour ('there's nothing you can't have if you want it enough'), and now we've reached the epoch—prodigious in its advent—when positively the air commands and dominates both land and sea; and we shall witness quite shortly a combination in one structure of the aeroplane, the airship, the parachute, the common balloon, and an aerial torpedo, which will both astound people by its simplicity and by its extraordinary possibilities, both in war and commerce (the torpedo will become cargo in commerce). The aeroplane has now to keep moving to live—but why should it? The aerial gyroscopic locomotive torpedo suspended by a parachute has a tremendous significance.

The Essence of War

"And let no one think like the ostrich that burying one's head in the sand will make invention desist. At the first Hague Peace Conference in 1899, when I was one of the British delegates, huge nonsense was talked about the amenities of war. War has no amenities, although Mr.

The Raid on Kronstadt

FROM a statement issued by the Admiralty on October 10 dealing with the operations against Kronstadt during the night, August 17–18, 1919, it appears that eight aircraft took part in the operation. The intention was that aircraft should attract all attention in Kronstadt, so that the C.M.B.'s should be neither heard nor seen to approach the harbour.

Although it is invidious to select any pilot or observer as particularly deserving of special mention for his work in an operation in which each fulfilled the duties allotted to him in a most efficient manner, the name of Capt. A. C. Randall,

Norman Angell attacked me in print for saying so. It's like two innocents playing single-stick; they agree, when they begin, not to hit hard; but it don't last long! Like fighting using only one fist against the other man with two; the other fist damn soon comes out! The ancient who formulated that 'All's fair in love and war' enunciated a great natural principle.

"*War is the essence of violence.*"

"*Moderation in war is imbecility.*"

"**HIT FIRST. HIT HARD. KEEP ON HITTING.**"

"The following reports and letter will illustrate this history of my efforts in this direction:—

"Lord Fisher returned to the Admiralty on October 30, 1914.

"38 S.S. airships were at once ordered—single-engine type. Six improved type.

"Before Lord Fisher left the Admiralty a design of a double-engine type was got out, and subsequently another 32 airships were ordered."

"CIRCULAR LETTER issued by Lord Fisher in 1914 when First Sea Lord:—

"Lord Fisher desires to express to all concerned his high appreciation of the service rendered by those who carried out the recent daring raid on Lake Constance.

"He considers that the flight mentioned, made over 250 miles of enemy country of the worst description, is a fine feat of endurance, courage, and skill, and reflects great credit on all who took part in the raid, and through them on the Air Service to which they belong."

"The following *précis* of correspondence is inserted because contributory to Lord Fisher's resignation. He had previously written to Mr. Churchill resigning on the ground of the disregard of his warnings respecting the aircraft menace:—

"An official Secret German dispatch, obtained from a German source, dated December 26, 1914:—

"The General Staff of the German Army are sending aircraft to attack French fortified places. Full use to be made of favourable weather conditions for attack of naval Zeppelins against the East Coast of England with the exception of London. The attack on London will follow later combined with the German Army airships.

"*Précis* of History of Rigid Airships of Zeppelin Type:—

"Lord Fisher, when First Sea Lord, in December, 1908, instructed Admiral Bacon to press for the construction of rigid airships for naval purposes at the meetings of a Sub-Committee of the Committee of Imperial Defence, which held its first meeting in December, 1908, after many meetings at which Admiral Bacon presented the naval point of view with much lucidity. The Committee recommended on January 28, 1909, the following:—

"(a) The Committee are of opinion that the dangers to which we might be exposed by developments in aerial navigation cannot be definitely ascertained until we ourselves possess airships.

"(b) There are good grounds for assuming that airships will prove of great value to the Navy for scouting and possibly for destructive purposes. From a military point of view they are also important.

"(c) A sum of £35,000 should be included in the Naval Estimates for the purpose of building an airship of a rigid type. The sum alluded to should include the cost of all preliminary and incidental expenses.

"(d) A sum of £10,000 should be included in Army Estimates for continuing experiments with navigable balloons of a non-rigid type, and for the purchase of complete non-rigid airships and their component parts.

"January 28, 1909.

"Approved by Committee of Imperial Defence,

"February 25, 1909."

"And nothing more was done till I came back to the Admiralty on October 30, 1914!"

D.F.C., may perhaps be mentioned as showing devotion to duty. This officer experienced what was apparently complete engine failure when half-way to Kronstadt. Just as he was about to land his engine restarted, and although he knew it was liable to fail again at any moment, he proceeded to Kronstadt, and took a very active part in the operation. His engine failed completely on the return journey.

The success of this operation reflects great credit on the part of the non-commissioned officers and airmen of the seaplane base and aerodrome. Their zealous and untiring work on machines no longer modern is most commendable.

SOPWITH (AUSTRALIA) TRANSPORT MACHINE :

360 H.P. Rolls-Royce "Eagle"

WITHIN the next few days, probably even before this week's issue of FLIGHT is distributed—to wit, Wednesday is the actual day selected—at least one of the machines entered for the Australian Government Prize Flight from England to Australia will

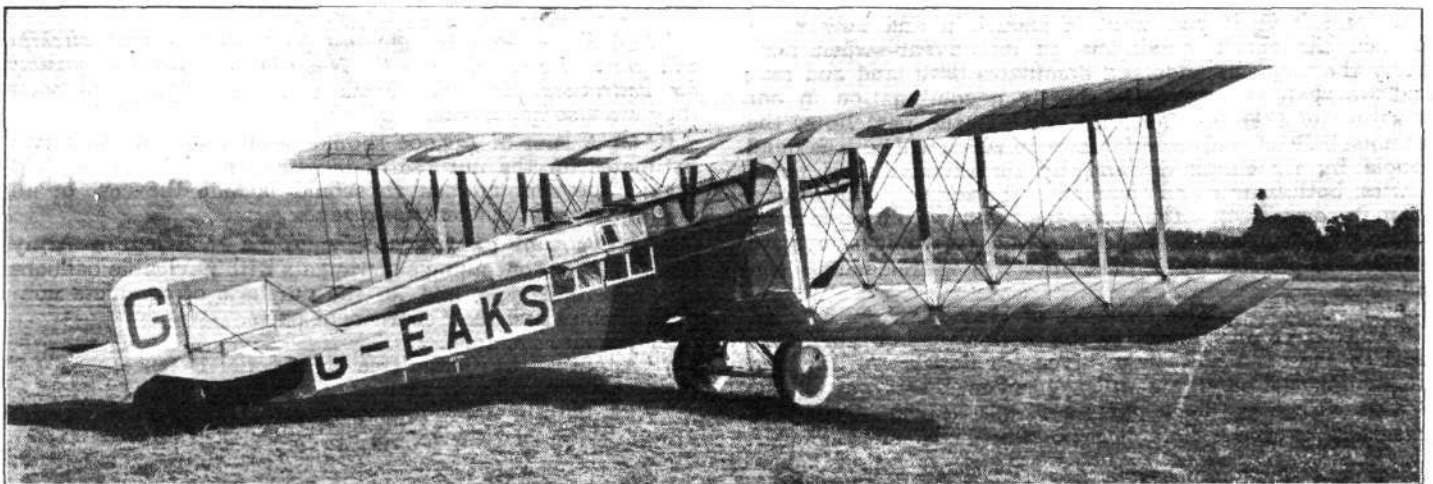
Being designed for such a long journey, one of the first considerations, next to aerodynamical efficiency, has naturally been the provision of the maximum of comfort for the occupants. As will be seen from the accompanying illustrations, the "Wallaby" has a



THE SOPWITH "WALLABY": Three-quarter front view

have left Hounslow on its long journey. This machine, a large biplane built by the Sopwith Aviation and Engineering Co., Ltd., is already finished, and during the last few days has been undergoing final tests at Brooklands, her performance and general ease of handling having proved very satisfactory. Through the courtesy of the Sopwith firm we are able this week to place before our readers a detailed description of this new Sopwith (Australia) Commercial aeroplane, illustrated by photographs and scale drawings. The machine, it will be seen, is not unlike the Transatlantic Sopwith in general outline, although being of somewhat larger dimensions. As

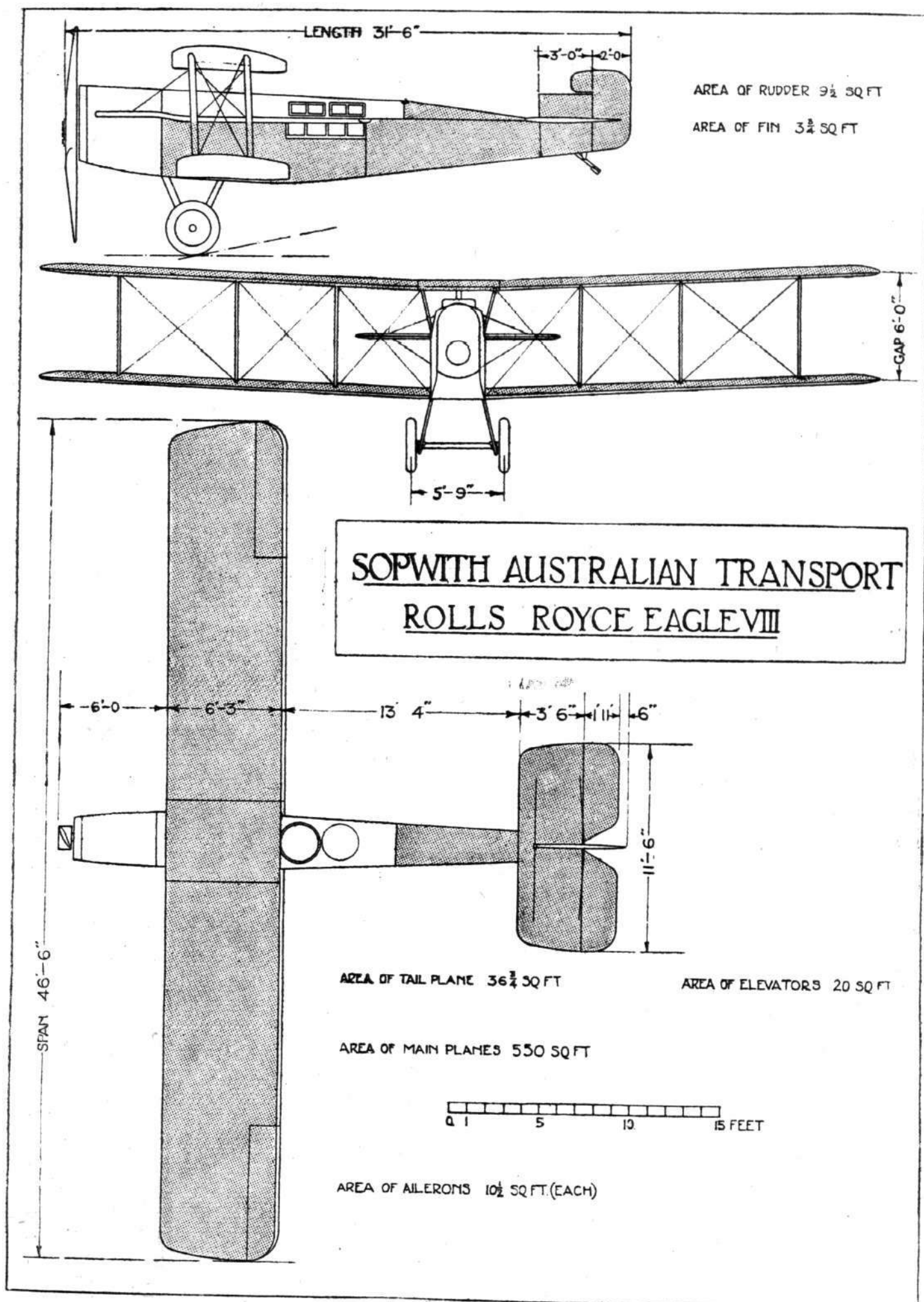
very deep *fuselage*, forming an enclosed cabin for the pilot and engineer. Inside this cabin are arranged the two seats, that of the pilot-navigator being in front. These seats are mounted on a tubular framework which can be raised and lowered, running on vertical tubular guides, and locked in any desired position. If, therefore, the pilot wishes to be absolutely protected from the weather he lowers his seat and draws the sliding panel in the roof of the cabin over the circular cockpit, when he is as comfortable as possible, out of the draught and noise. Just before landing, or if, for any reason, during the voyage he wishes to obtain a better view than that



THE SOPWITH "WALLABY": Three-quarter rear view

a matter of fact, that machine has more or less formed a basis for the design of the "Wallaby," as the new biplane is called, and the experience gained with the Transatlantic 'bus has been made good use of in the design of the "Wallaby."

afforded from inside the cabin, it is a matter of a few seconds only to slide the panel forward, raise the seat, and he is then in the same position, relatively to the *fuselage* and wings, as in an open machine. The rear cockpit is similarly arranged.



THE SOPWITH "WALLABY": Plan, side and front elevations to scale

All the controls are in duplicate, the "stick" being a tube which slips into the socket on the control shaft. At a moment's notice, therefore, either of the occupants can take over the control of the machine, the other withdrawing his "stick" and placing it on the side of the *fuselage*, where suitable clips are provided. An interesting feature of the pilot's controls is that the rudder bar is in duplicate, one bar being placed low near the floor, the other higher up to correspond with the highest position of the seat. In this manner, no matter at what height the seat is placed, one foot bar is in a comfortable position, and as a matter of fact even with the seat at its highest position the lower foot bar is within reach, thus allowing the pilot to stretch his legs without taking his feet off the rudder control. For a flight of the duration of that contemplated, this is a point that deserves consideration.

As the *fuselage* of the "Wallaby" is of considerable

note that Capt. Matthews has designed a special Azimuth Mirror, placed handy when not in use, which slides along the circular edge of the front cockpit, this being graduated all round.

The pilot-navigator of the Sopwith "Wallaby," Capt. Matthews, is an old hand at sea navigation, and therefore knows the idiosyncrasies of compasses. He is taking no chances, and is carrying no less than three, one large and two smaller, one of which is mounted in the engineer's cockpit. In order to facilitate communication between pilot and engineer there is no partition between the two cockpits, and the back of the pilot's seat is in the form of a canvas flap, which can easily be pulled down out of the way, allowing him if desired to walk back to the rear of the cabin. Placed in racks along the sides of the *fuselage* are a number of smoke bombs, which after dropping some 500 ft. ignite and produce a dense black smoke. When the machine is out of sight of



THE SOPWITH "WALLABY": Side view

cross section, the instruments carried occupy only a small portion of the dash in front of the pilot. The space thus left is utilised by providing a locker, holding two ply-wood trays to which are pinned the maps of the country over which the machine is passing. Fixed to these trays with small metal clips are parallel rulers, dividers, etc., so that the pilot, who incidentally is also the navigator, has at his finger tips all the instruments required for working out his course. When not in use these maps are pushed into the locker and the door closed.

Triplex windows are provided in the sides of the *fuselage*, and a small window is also fitted in the floor in front of the pilot. The latter window is ruled with a set of lines, one running parallel with the longitudinal axis of the machine, and others forming various angles with it. By watching through this window the path traced out by objects on the ground the pilot can get a very good indication of the drift—that is to say, the angle between the course steered and the course made good. It is also of interest to

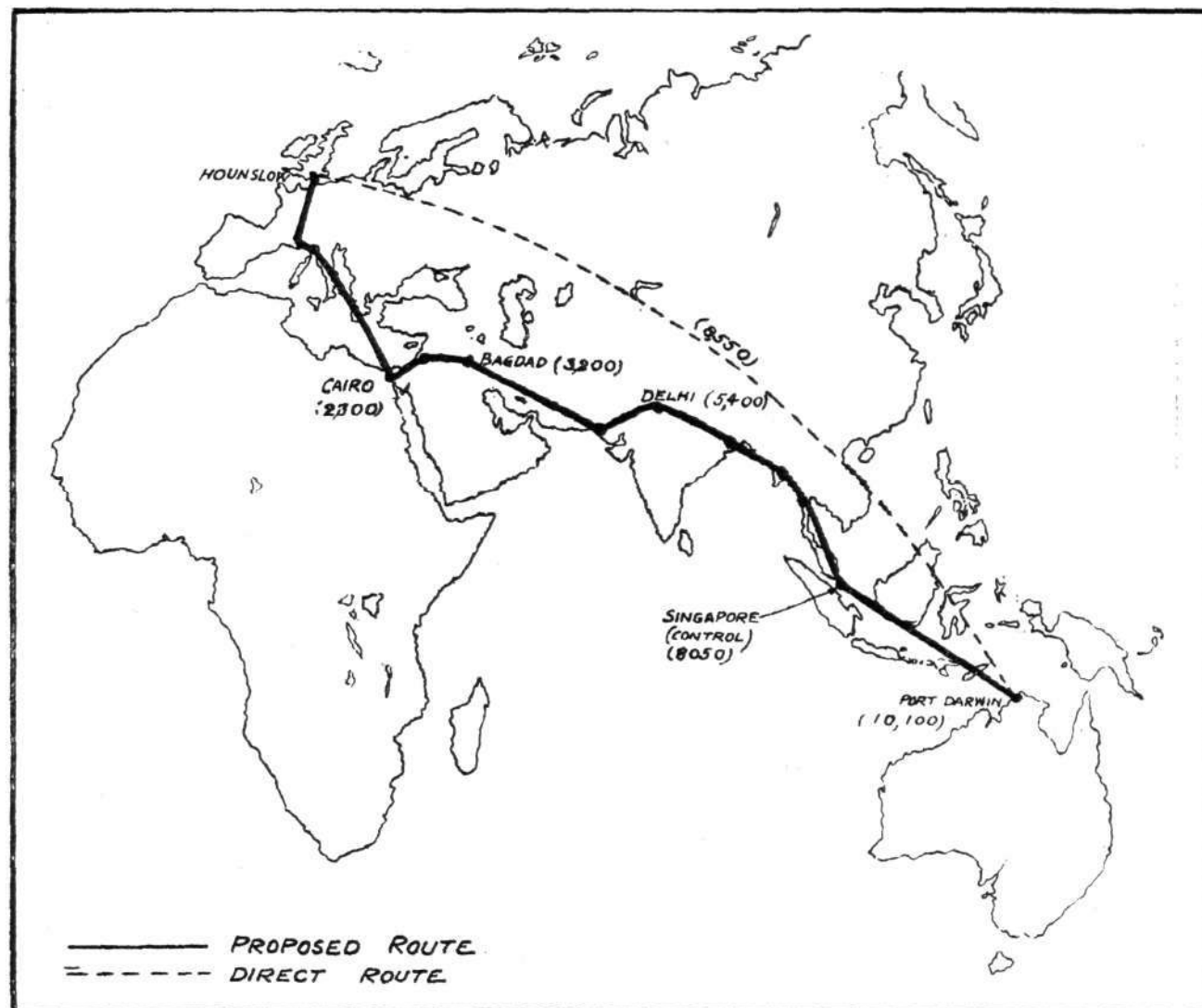
the ground these will form a very useful means of ascertaining the drift of the machine. Incidentally, one would imagine that they might be very useful in case of a forced landing far away from inhabited areas, as smoke signalling is one of the oldest in the world and is used by most native tribes.

A very interesting instrument, which we do not remember having seen on a commercial aeroplane before, is fitted to the Sopwith. This is known as a turn meter, and consists of two swivelling tubes, terminating in a funnel at the rear, mounted one on each wing tip in front of the leading edge. These two tubes are connected up to an indicator in the cabin, on which the slightest turn is shown. This instrument, which is, we understand, very delicate, should be very useful in case of flying in clouds, when a machine usually begins to swing off her course first to one side and then to the other, until the compass swings to such an extent that the pilot no longer knows quite what the machine is doing.

The Rolls-Royce "Eagle," Mark VIII, is placed

immediately behind a nose radiator, and is supplied with petrol from a gravity tank placed in the top centre section. Petrol is forced from the main tank, which is placed between the engine and the cabin and has a capacity of about 200 gallons, to this top tank. A very ingenious flow meter is fitted on the latter, indicating at any time the rate at which the fuel is being consumed. In the top centre section is also placed a water tank holding about 25 gallons of water, connected up to the radiator by a flexible rubber tube. Another tube, it might be mentioned incidentally, runs from the nose of the machine, through the engine housing and to the cabin, supplying the latter with fresh air. Two long exhaust pipes run back to the rear of the cabin, and serve as very

gives a wing loading, empty, of 5.05 lbs./sq. ft. and a power loading, empty, of 7.75 lbs./h.p. As already mentioned, the tanks have a capacity of 200 gallons, and with the weight of occupants and full equipment the weight "all on" is 5,200 lbs. This gives a wing loading of 9.45 lbs./sq. ft. and a power loading of 14.5 lbs./h.p. With full load the maximum speed is about 121 m.p.h., and the minimum speed 48 m.p.h. The cruising speed at 5,000 ft. and at a petrol consumption of 15 gallons per hour, is 107 m.p.h., which gives a range of about 1,500 miles. This is ample for any overseas distance that has to be covered during the flight to Australia, and should also give a very good margin for any of the overland stages over country unsuitable for landing. As an example



Diagrammatic sketch map of the route to Australia. The distances shown are approximate

effective silencers, the noise inside when the two panels in the roof are closed being almost negligible.

As will be seen from the scale drawings, the Sopwith "Wallaby" is a three-strutter, the large span making this arrangement advisable. The under carriage is of the usual simple Vee type, with rather a narrow track. Wing tip hoops have therefore been fitted.

For the rest, the Sopwith "Wallaby" follows standard practice in design and construction. The tail plane is provided with the usual trimming gear, the wheel control of which may be seen in the side view of the machine. There is a rectangular-shape vertical fin, to which is hinged the balanced rudder.

As will be seen from the general arrangement drawings, the total wing area is 550 sq. ft. The weight of the machine, empty, is 2,780 lbs., which

of the efficiency of the Sopwith "Wallaby" it is of more than passing interest to note that the ratio

Useful Load = $\frac{2,420}{5,200} = 46.5$ per cent., which is distinctly good. Incidentally, it might be mentioned that the usefulness of the "Wallaby" is by no means restricted to the flight to Australia. By altering the cabin and seating accommodation it is possible to get in eight people (including the pilot), when the machine would have a range of 500 miles at a speed of 107 m.p.h.

The Flight Itself

With regard to the actual flight to Australia, the difficulties are many and the country over which the machine will have to pass is in many cases anything but inviting in case of engine failure.

However, the Rolls-Royce Eagle, Mark VIII, has a good reputation for "sticking it." All possibilities have, however, been taken into consideration, and a number of spare parts will be taken, including a spare propeller. This is, we think, a very wise precaution, since it is quite conceivable that during a forced landing the propeller might be damaged, which, even if no other damage occurred, would effectively prevent getting off again, while if a spare propeller is carried it should be possible to effect repairs and proceed on the journey. As to the route followed, this will, we understand, be that known as Air Ministry Route No. 1 to India. It is indicated in the accompanying sketch map, on which are also marked some of the distances in miles. These are, it should be pointed out, only approximately correct. The direct route to Australia is shown on the map in dotted lines. It will be seen that this goes a good deal farther to the north than the route which it is proposed to follow, and that it is very considerably

completion of such a flight would give a strong fillip to aviation in that country.

The height at which it is intended to fly will vary with local conditions, but Capt. Matthews expects to do the flight at an average altitude of somewhere between 6,000 and 10,000 ft. For supplies of food, etc., Capt. Matthews is relying on the hospitality of the countries in which he will have to land, but it may be mentioned that, acting on the advice of the Air Ministry, he is carrying a repeating rifle in the aeroplane, so that if any natives among whom he may find himself show signs of hostilities, these may be answered in a suitable manner.

The Pilot-Navigator and the Engineer

Before concluding, it may be of interest to give a brief reference to the careers of the two men who will attempt this hazardous journey. The pilot-navigator is Capt. George Campbell Matthews, A.F.C., of the Australian Flying Corps, and the engineer is Sergt.



THE FLIGHT TO AUSTRALIA: On the left, the pilot-navigator of the Sopwith machine, Capt. G. C. Matthews, A.F.C.; and, on the right, his engineer, Sergeant T. Kay.

shorter. The start will be made from Hounslow, and the machine will then fly across France, down to Pisa. From there to Capua and Taranto, from which latter place the machine will make for Valona, in Albania, and proceed down across Greece and hence to Cairo. From Cairo to Damascus and Bagdad, and hence to Karachi. From Karachi to Delhi, Calcutta, Rangoon and Singapore, at which latter place there is a control. From Singapore to Batavia, and along the Dutch East Indian Islands to Timor, and then the last stage across to Port Darwin, Australia. The journey is one full of dangers, and the pilot who makes it may well be proud of his achievement. According to the terms of the Australian Government Prize, the maximum time allowed is 30 days, but as Capt. Matthews points out, he is, as a member of the Larkin-Sopwith Company of Australia, far more interested in demonstrating the possibility of making such a long-distance flight on a single-engined machine than in winning the cash prize, although naturally he will do his best to win it. He is convinced that Australia offers an excellent field for aeronautical development, and that the successful

Tom Kay, also of the Australian Flying Corps.

Capt. Matthews is 36 years of age, and has had a strenuous career, which particularly fits him for the rigours of this arduous flight. He has spent 12 years at sea in the Mercantile Marine as a practical navigator, and holds an extra-master's certificate. In his own words, he has been "all over the world and many other places."

On the outbreak of war, he was acting as chief officer of a passenger steamer off the Australian coast, but he at once left and joined the Australian Light Horse as a trooper. He received his commission at Gallipoli, and subsequently served 2½ years with that Force at the Dardanelles and also in Egypt. Whilst in the latter country, he found himself unable to resist the attractions of a flying career, and joining the R.F.C., he took his pilot's certificate in February, 1917, afterwards proceeding out to France with the 1st Australian Scout Squadron, No. 68 R.F.C., in September. After three months in France, he returned to England to be promoted Flight Commander of the No. 4 Australian Scout Squadron, which was then flying Sopwith Camels.

When the Australian Training Wing was formed in England, Capt. Matthews returned to it as Wing Examiner. He has flown some 21 different types of machines, and is a pilot of the most fearless and reliable type, his long maritime experience having proved of the greatest value to him in the air. A better air pilot could hardly have been chosen for this great air flight, for Capt. Matthews has an intimate knowledge of the Malay Archipelago, the Celebes Islands and other islands of the Pacific.

Sergt. Kay, who is accompanying him, is one of the best Australian mechanics, and has had a long experience of internal combustion engines. He is not himself a qualified pilot, but whilst waiting to start,

Capt. Matthews has trained him in the management of the Australian machine, "The Wallaby," so that he can act as a relief when the machine is in the air and at a fair height.

As an instance of the sporting spirit and good will which exists between British aviation firms, we think it should be mentioned that the Airco firm, who have had about two months' experience in regular commercial air services, have placed all their logs of the London-Paris Air Service at the disposal of Sopwiths, containing a vast amount of extremely useful data and experience, which is acknowledged to be of the very greatest assistance to Sopwiths in planning this long flight.



U.S. Advisory Committee to Erect Laboratory

At a meeting of the United States Advisory Committee for Aeronautics, recently, the construction of an engine dynamometer laboratory was authorised. The laboratory will be erected on the Committee's plot at Langley Field, and will cost approximately \$15,000.

The purpose of the laboratory is to test internal combustion engines, conduct researches, and advance the development in aircraft engines. The study of related problems, including the co-relation of engine performance in free flight with the results obtained on the test stand, will also be made.

U.S. Aircraft Development

On October 10 the Senate Military Committee recommended an additional appropriation of \$15,000,000

(£3,000,000) for Army aircraft construction in connection with the establishment of air routes to Panama, Alaska, and probably Asia.

It may be recalled that last August the United States Naval and Army authorities asked Congress for an appropriation of \$129,000,000 (£25,800,000) for the current year, but got only \$50,000,000 (£10,000,000), about one-seventh of the sum allowed the R.A.F.

East Fortune to be Abandoned

It is stated that the Air Ministry has decided to abandon East Fortune airship station in Haddingtonshire, the establishment, with all removable material and plant, being removed to a Yorkshire aerodrome.

It is understood that the airship R 29 is immediately to be broken up.



"Flight" Copyright.

LONDON FROM ABOVE: A glimpse through the clouds of St. Paul's Cathedral and the winding Thames, with its numerous bridges.

The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

First Direct Non-Stop Trans-Atlantic Flight

THERE has been a wide-spread expression of opinion that the first direct Trans-Atlantic Flight by Sir John Alcock and Sir Arthur Brown on a Vickers-Vimy-Rolls Biplane on June 14-15, 1919, should be permanently recorded in the Club House.

The idea has been fully considered by the Committee, and they have decided to obtain portraits in oils, for hanging in the Club, of both Sir John Alcock and Sir Arthur Brown.

Sir John Lavery has very kindly consented to paint the portraits at a purely nominal figure, the canvases being 30 ins. by 25 ins.

A subscription list has been opened, and subscriptions, limited to £1 is., are invited towards the cost.

Coupe Henry Deutsch de la Meurthe

Organised by the *Aéro Club de France* under the Regulations of the *Fédération Aéronautique Internationale* and the *Commission Sportive Aéronautique de France*.

The Cup is an objet d'art of the value of 10,000 francs, with prizes of 20,000 francs each, to be awarded to the first three holders of the Cup.

1st Holder: Emmanuel Helen, May 1, 1912. Distance, 200 kils. Time, 1 hour 30 mins.

2nd Holder: Eugene Gilbert, October 27, 1913. Distance, 200 kils. Time, 1 hour 13 mins. 25 secs.

The third prize of 20,000 francs is now open for competition. It is a speed contest in a closed circuit of about 200 kilometres, embracing Terrasse de St. Germain, Senlis, Meaux, Melun, Terrasse de St. Germain.

On September 2 last Sadi Leconte completed the course in 48 mins. 8 secs., giving an average speed of 249 kils. 307 m. per hour.

If this speed is not beaten by one-tenth within one year Sadi Leconte will be the winner of the third prize of 20,000 francs, and the final holder of the Trophy.

Particulars of the Competition can be obtained from the Royal Aero Club.

Fédération Aéronautique Internationale Conference

The Conference of the *Fédération Aéronautique Internationale* will be held at Brussels on October 22, 23 and 24, 1919. The following delegates will represent the Royal Aero Club:—

Lieut.-Col. F. K. McClean.

Lieut.-Col. Alec Ogilvie.

Lieut.-Col. Mervyn O'Gorman, C.B.

Mr. Harold E. Perrin (Secretary).

Offices: THE ROYAL AERO CLUB,

3, CLIFFORD STREET, LONDON, W. 1.

H. E. PERRIN, Secretary.

THE R.A.F. CADET COLLEGE

THE Air Ministry has just issued a small booklet containing the regulations for the Royal Air Force Cadet College. It is obtainable from H.M. Stationery Office or their agents and from any bookstall at 3d.

The R.A.F. Cadet College has been instituted for the purpose of affording special education to candidates for commissions in the R.A.F., and is intended exclusively for those who desire to make the R.A.F. their permanent profession in life.

The limits of age for admission to the College will be from 17½ to 19 years, with the exception of those who have served or are serving in the forces, and are recommended by their C.O. for a permanent commission in the R.A.F., in which case the upper age limit will be 21. All applications for the printed form of application for admission to the examination should be made to the Secretary, Civil Service Commission, Burlington Gardens, London, W. 1.

The booklet sets forth in detail the subjects for examination and possible marks. The subjects for the entrance examination which are obligatory are English, English history and geography, elementary mathematics, and one modern language. The optional subjects are Latin, Greek, another modern language, mathematics (elementary, intermediate and higher), science and elementary engineering. All the obligatory subjects must be taken, but not more than three of the optional class may be taken, and candidates will be expected to qualify (to obtain not less than 33 per cent. of the total marks allotted) in each of the four obligatory subjects. Candidates will receive extra marks if they hold Certificate A from the O.T.C., or if they have served in the senior division of the O.T.C., or if they have completed four months' continuous service as officers, warrant officers, or non-commissioned officers and men in the services. A certificate to this effect must be furnished on a form supplied to applicants by the Civil Service Commissioners.

A certain number of prize cadetships will be awarded

to successful competitors in order of merit at such examination, carrying certain emoluments and financial benefits. These are designed to give assistance to those who stand in need of the emoluments attached to them. Each candidate for cadetship will be examined by a medical board.

There will also be King's Cadets appointed by the Secretary of State for Air, and Honorary King's Cadets nominated by the Secretary of State for Air, and a limited number of cadetships will occasionally be filled by suitable candidates specially nominated by the Air Council, such recommendation being submitted by the candidate's headmaster.

The course of studies at the R.A.F. College during the first year will include: English literature and language; the British Empire; practical mathematics—including mechanics and draughtsmanship; general elementary science; history of the R.A.F.; outline of Army and Navy organisation and characteristics of the various arms and types of ships; map reading; R.A.F. law and administration; drill (with rifles) and physical training; hygiene and sanitation; practical work in the workshops; the Morse code; passenger flying with instruction in map reading, and use of compass and machine gun.

During the second year the course will be: Theoretical and practical instruction in engines, including magnetos and their management; theory of flight; practical rigging; advanced work in wood and metal workshops; wireless telegraphy and telephony; machine and Lewis gun; instruction in aviation.

The terms of payment are under consideration, and will be issued shortly. They will correspond generally with those at the Royal Military Academy and Royal Military College, excepting that the R.A.F. Cadets will draw pay at 5s. a day during their first year's course, and 10s. a day during their second year's course. Other details concerning the syllabus of instruction at the College, government and organisation, discipline, etc., will be found in the booklet.

Commercial Services in China

It is stated that the Chinese Government has entered into a contract with Messrs. Vickers, Ltd. for the supply of a large number of Vickers Vimy commercial aeroplanes of a type similar to the winner of the *Daily Mail* £10,000 prize for the first direct flight across the Atlantic, with certain

modifications. To meet the cost of the purchase of machines, construction of aerodromes, repair depôts, and administration, the Chinese Government are making an issue of one million, eight hundred thousand pounds in Treasury Notes, all of which is to be expended in the development of commercial aviation.

HONOURS

THE following announcements appeared in a supplement to the *London Gazette* on October 10:—

The King has been pleased to give orders for the following appointments to the Most Honourable Order of the Bath, in recognition of distinguished services rendered during the War:—

C.B. (Military Division)

Group Capt. P. R. C. Groves, C.M.G., D.S.O., R.A.F.
Wing-Com. A. J. L. Scott, M.C., A.F.C., R.A.F.

The King has been pleased to give directions for the following appointments to the Most Distinguished Order of Saint Michael and Saint George, in recognition of distinguished services rendered during the War:—

C.M.G.

Group Capt. R. H. Clark-Hall, D.S.O., R.A.F.; Maj. (A./Lieut.-Col. R. D. Waterhouse, R.A.F.

The King has been pleased to give orders for the following promotions in and appointments to the Most Excellent Order of the British Empire, in recognition of distinguished services rendered during the War:—

C.B.E. (Military Division)

Royal Air Force

Wing-Com. (A/Air Commodore) F. G. Willock, D.S.O.; Chaplain-in-Chief Rev. H. D. L. Viener, M.A.; Wing-Com. (A/Group-Capt.) A. D. Cunningham, O.B.E.; Hon. Col. L. Munro, O.B.E. (Col., Retd. List, Hants R.); Wing-Com. W. D. Beatty, O.B.E.; A.F.C., Squad-Leader (A/Wing-Com.) J. L. Birley, O.B.E.; Wing-Com. F. L. M. Boothby; Wing-Com. I. T. Courtney, O.B.E.; Wing-Com. E. H. Griffith, O.B.E.; Wing-Com. J. Mead, M.C.; Wing-Com. H. W. S. Outram; Wing-Com. R. C. M. Pink; Wing-Com. F. H. G. Playfair; Wing-Com. H. L. Woodcock; Lieut.-Col. W. E. S. Burch (R. Ir. Regt.); Maj. (Hon. Lieut.-Col.) A. H. Cheate, O.B.E.; Lieut.-Col. G. Dreyer, O.B.E.; Lieut.-Col. E. R. Peal, O.B.E., D.S.C.; Lieut.-Col. A. E. J. Reiss, O.B.E.; Dr. Miss J. L. D. Fairfield, M.D.; Maj. A. H. Hogarth, O.B.E., D.C.M.

O.B.E. (Military Division)

Flight-Lieut. (A/Wing-Com.) A. H. S. Baker, M.B.E.; Squad-Leader (A/Wing-Com.) O. T. Boyo, M.C., A.F.C.; Wing-Com. J. L. Forbes; Squad-Leader (A/Wing-Com.) A. H. C. Kearsey, D.S.O.; Wing-Com. C. Kirby; Wing-Com. A. T. L. Nye; Wing-Com. F. Ranken; Squad-Leader (A/Wing-Com.) A. V. J. Richardson; Squad-Leader (A/Wing-Com.) J. D. K. Restler; Wing-Com. J. L. Travers; Lieut.-Col. I. B. Davson; Squad-Leader J. P. Bourke; Flight-Lieut. (A/Squad-Leader) A. P. Bowdler; Squad-Leader A. R. Boyle, M.C.; Squad-Leader A. G. H. Carr; Flight-Lieut. (A/Squad-Leader) E. W. F. Cherry; Squad-Leader H. A. Cox; Squad-Leader W. J. Y. Guilfoyle, M.C.; Squad-Leader D. H. Kennedy; Squad-Leader T. G. Leith, M.B.E.; Flying Officer (A/Squad-Leader) C. H. Lewis; Squad-Leader J. H. Lidderdale; Squad-Leader E. S. Saunders; Squad-Leader C. J. Stewart; Squad-Leader H. C. Wakefield; Squad-Leader R. H. Woods, M.C.; Maj. P. C. A. Bridgeman; Maj. E. C. Clements (R.A.M.C.T.); Capt. (A/Maj.) J. de Francia; Maj. A. C. Hartley; Maj. T. G. Hull; Capt. (Hon. Maj.) T. O. H. Lees, A.F.C.; Maj. O. C. Macpherson (Canada); Capt. (A/Maj.) J. M. Mitchell, M.B.E. (Canada); Maj. W. Park; Maj. D. B. Sanders; Maj. A. E. Snape; Flight-Lieut. C. B. Baker; Flight-Lieut. D. S. K. Crosbie; Flight-Lieut. G. F. Evans; Flight-Lieut. D. Gordon; Flight-Lieut. H. T. Humfress; Flight-Lieut. G. W. C. Kaye; Flight-Lieut. D. Munro; Flight-Lieut. G. C. Shepherd; Flight-Lieut. W. P. Smith; Flight-Lieut. J. B. Walker; Asst. Comdt. Miss K. L. Curlett, W.R.A.F.; A/Matron Mrs. L. O. Doughty-Wylie, M.B.E., R.R.C.

M.B.E. (Military Division)

Flying Officer (A/Squad-Leader) E. B. Barker; Squad-Leader H. N. Wylie; Flight-Lieut. T. Armstrong; Flying Officer (A/Flight-Lieut.) W. E. Berwick; Flying Officer (A/Flight-Lieut.) H. B. Dakin; Flying Officer (A/Flight-Lieut.) D. B. Gunn; Flight-Lieut. H. G. Hutchinson; Flight-Lieut. J. H. Ledeboer; Flight-Lieut. J. A. C. Sumner; Flight-Lieut. F. Tedman; Flight-Lieut. F. K. Wells; Capt. L. Crooks; Capt. A. J. Dawson; Capt. I. N. Dracopoli; Capt. J. M. Furnival; Capt. T. Greening; Capt. G. Ralston; Flying Officer H. S. Burdett; Flying Officer D. P. Cameron; Flying Officer A. T. Hughes; Flying Officer H. D. Lehmann; Flying Officer W. L. Shaw; Flying Officer R. A. Shephard-Walwyn; Flying Officer G. T. Stroud; Flying Officer C. H. Tancred; Flying Officer G. V. Walsh; Lieut. A. C. Blackmore; Pilot-Officer W. E. Critchley; Pilot-Officer W. E. Humphreys; Pilot-Officer T. A. Ross; Obs. Officer G. C.

Shortridge; Pilot Officer J. E. Tyrrell; Pilot Officer S. G. Young; Administrator Miss A. L. Chauncey, W.R.A.F.

The King has been pleased to approve of the undermentioned rewards to Officers and other ranks of the Royal Air Force, in recognition of distinguished services rendered during the War:—

Distinguished Flying Cross

Squad-Leader C. H. Stringer; Flight-Lieut. E. D. Crundall; Flight-Lieut. F. W. Hudson; Flight-Lieut. the Hon. E. G. W. T. Knollys, M.B.E.; Flying Officer (A/Flight-Lieut.) A. D. Makins; Flight-Lieut. E. A. Packe; Flight-Lieut. F. X. Russell; Flying Officer E. L. Barrington, M.C.; Flying Officer R. S. Jameson; Flying Officer F. C. C. Yeats-Brown; Lieut. W. E. Bottrill (Can. Inf.); Lieut. G. M. Eiloart; Pilot Officer H. Lovelady; Pilot Officer F. W. Sinclair.

Air Force Cross

Wing-Com. W. D. Beatty, C.B.E.; Squad-Leader (A/Wing-Com.) O. T. Boyd, O.B.E., M.C.; Wing-Com. R. B. Davies, V.C., D.S.O.; Squad-Leader (A/Wing-Com.) E. H. Sparling; Squad-Leader (A/Wing-Com.) L. Tomkinson; Flight-Lieut. (A/Squad-Leader) D. G. Donald; Flight-Lieut. (A/Squad-Leader) R. F. S. Leslie, D.S.C., D.F.C.; Squad-Leader T. K. Elmsley; Squad-Leader V. Gaskell-Blackburn; Squad-Leader M. E. A. Wright; Flight-Lieut. W. R. D. Acland; Flight-Lieut. C. H. Elliott-Smith; Flight-Lieut. F. M. Fox; Flight-Lieut. T. A. Gladstone; Flying Officer (A/Flight-Lieut.) A. F. Hordern; Flight-Lieut. Ft. Nuttall, M.C., D.F.C.; Flying Officer (A/Flight-Lieut.) L. N. Sutherland; Capt. R. M. Stirling; Flying Officer W. Armstrong; Flying Officer G. H. Boyce; Flying Officer H. E. Cardwell; Flying Officer R. Douglas (S.A.D.F.); Flying Officer W. T. Garrood; Flying Officer L. A. C. Hudson; Flying Officer L. M. Iles; Flying Officer A. Lanman; Flying Officer J. D. Mail; Flying Officer A. S. Meyrick Jones; Flying Officer J. McF. D. Mills; Flying Officer L. G. Paget; Flying Officer J. R. I. Scambler; Flying Officer G. J. Squires; Flying Officer M. L. Trapagna-Leroy; Flying Officer S. S. Turnbull; Lieut. H. A. Miller; Lieut. J. A. Smale; Lieut. A. J. G. Stryan, M.C.; Lieut. N. T. Thorneloe; Pilot Officer C. N. C. Dickson; Pilot Officer F. de M. Hyde; Pilot Officer T. Rennie; Pilot Officer P. S. Riach; Pilot Officer L. G. Warren; Obs. Officer E. A. Westall; Pilot Officer I. S. Woodhouse.

Air Force Medal

No. 1357 Sergt.-Maj. 2 J. Barrett; No. 5323 Sergt.-Obs. J. Gilhooly.

Medal of the Order of the British Empire (for Gallant Conduct in France)

No. 46031 Corpl. F. Harrison.

Meritorious Service Medal

No. 4395 Corpl. W. W. Adkins; No. 26805 Sergt. H. C. Ashwell; No. 30979 Corpl. F. S. Bowles; No. 219650 A/C 1 C. H. Greenwood; No. 40573 Corpl. T. W. E. Heath; No. 1169 S./M. 1 J. Hudson; No. 215 S./M. 1 J. Kerr; No. 302427 Corpl. J. Lister; No. 1783 Flight-Sergt. J. F. Morrison; No. 18304 Flight-Sergt. J. E. Pays; No. 36955 Corpl. G. Papworth; No. 23725 Sergt. W. J. Payne; No. 93866 Sergt. J. Poole; No. 33436 L.A.C. A. J. Pickering; No. 37883 Flight-Sergt. G. H. Toogood; No. 132183 A./C./H. 2 J. H. Walker.

The following have been mentioned in dispatches and reports for Distinguished Service in the Field:—

Squad-Leader A. G. H. Carr; Squad-Leader W. J. Y. Guilfoyle; Squad-Leader H. C. Wakefield; Flying Officer J. R. Hovenden; Flying Officer E. F. L. Taylor; Lieut. J. McL. Pearson; Lieut. McL. N. Straight; No. 42792 Sergt. H. S. Dodd; No. 403621 Sergt. R. Fairbrother; No. 44805 Sergt. T. W. Harman; No. 66256 Corpl. F. W. J. Hunt; No. 115589 Sergt. H. E. Mee; No. 403646 Sergt. H. G. Mitchell; No. 90730 Sergt. G. T. Watt; No. 500 Flight-Sergt. T. E. Whittaker.

Royal Red Cross, 1st Class

A/Matron Miss J. M. Cruickshank (Q.A.I.M.N.S.R.).

Foreign Decorations

The King has granted unrestricted permission for the wearing of the following decorations, conferred on the officers and other ranks of the Royal Air Force indicated for valuable services rendered in connection with the War:—

CONFERRED BY THE PRESIDENT OF THE FRENCH REPUBLIC
Legion of Honour (Croix de Chevalier)

Lieut. G. G. Bell, D.F.C. (Canadian L. Forces); Lieut. J. S. E. Townsend, R.N.V.R., attd. Naval Air Service.

Croix de Guerre, avec Palme

Lieut. D. A. Davies, D.F.C.; Lieut. C. B. Green, D.F.C. (Can. L. Forces); Lieut. H. J. Gibson; Lieut. A. E. de M. Jarvis, D.F.C. (Can. L. Forces).

Croix de Guerre, avec Etoile en Vermeil

Lieut. H. G. Davis, D.F.C.

Médaille Militaire

No. 54267 Sergt.-Mech. C. R. L. Falcy, D.C.M.; No. 25197 Corpl. (A/Sergt.) H. R. Heys.

Médaille d'Honneur, avec Glaives en Vermeil

Capt. A. F. Nimmo.

Médaille d'Honneur, avec Glaives en Argent

No. 29991 Sergt. W. L. Reeve; No. 4705 Sergt. T. E. Williams.

Médaille d'Honneur, avec Glaives en Bronze

No. 4388 Corpl. J. C. Steadman.

CONFERRED BY THE KING OF ROUMANIA
Order of the Crown of Roumania (Commander)
Lieut.-Col. R. D. Waterhouse, C.M.G.

CONFERRED BY THE KING OF THE HELLENES

Greek Military Cross, 3rd Class
Capt. F. A. Bates, M.C., A.F.C.

Medal of Military Merit, 3rd Class
Squad.-Leader S. G. Hodges, M.C., A.F.C.



PERSONALS

Deaths

Capt. REGINALD GEORGE HEWETT PIXLEY, M.C., 7th London Brigade, R.F.A., attached R.F.C., who was reported missing on June 4, 1917, and is now ascertained to have been killed in action on that date, at the age of 24, was the younger son of Maj. and Mrs. Stewart A. Pixley, of Woking.

Married

Capt. GERARD FANE, D.S.C., R.F.C., was married on October 1 at St. Andrew's, Raveningham, Norfolk, to CONSTANCE RHODA ELIZABETH, daughter of Mr. and Mrs. NICHOLAS BACON, of Raveningham Hall.

Wing-Com. SIR NORMAN LESLIE, Bart., C.B.E., was married on October 4 at St. George's Church, rue Auguste Vacquerie, Paris, to BETTY ELISE SEWELL, daughter of Mr. J. T. B. Sewell, C.B.E., LL.D., and of Mrs. Sewell, of 47, Boulevard Lannes, Paris.

Items

Maj.-Gen. SIR FREDERICK SYKES (Controller-General of Civil Aviation) had the honour of being received by His Majesty at Buckingham Palace on October 11, when the King invested him with the Insignia of a Knight Grand Cross of the Most Excellent Order of the British Empire (Military Division).

Lieut.-Col. ROBIN GREY, R.A.F., also had the honour of being received by His Majesty, when the King invested him with the Insignia of a Companion of the Distinguished Service Order.

Mr. ALBERT VICKERS, of Cadogan Square, S.W., and of Vickers House, Broadway, Westminster, S.W., lately chairman of Messrs. Vickers, Ltd., who died at Eastbourne on July 12 last, aged 80, left a fortune of the gross value of £886,584, with net personalty £759,747. The duties on the property at the sworn valuation will amount to £177,400.

THE AMERICAN TRANS-CONTINENTAL RACE

FOR the great race across the United States and back again, which started on October 8, New York was the favourite starting-place, 48 machines starting at two-minute intervals from 9 a.m. from the Mineola field, while 15 set out from San Francisco to fly in the reverse direction. Along the route of 2,700 miles, 21 controls had been established, and flying was restricted to daylight, while at the turning points two days had to be spent. Although the race was only open to U.S. service pilots, Air-Commodore L. O. Charlton, the British air attaché at Washington, was invited to start first. Slight trouble with the petrol supply precluded this, however, and the Bristol-Rolls-Royce fighter was the eleventh machine to leave Mineola. Unfortunately the petrol trouble recurred, and a forced landing was made at Ithaca, the machine hitting a fence and being wrecked. Air-Commodore Charlton and Flight Capt. T. Traill, escaped with a shaking.

Lieut. Maynard, who before the War was a clergyman, and who won the New York-Toronto race, took the lead of the westbound flyers, and reached North Platte, Nebraska, at 4.14 p.m., and five minutes later the leader from San Francisco, Capt. L. N. Smith, also landed there. Lieut. Maynard subsequently reached Cheyenne, Wyoming, where he was delayed for a day by a broken propeller, while Capt. Smith reached Omaha, Neb.

The Royal Aeronautical Society

ALTHOUGH the full syllabus for the next session of the Royal Aeronautical Society has not yet been completed, it has been decided to hold the opening meeting on October 29, when Sir Horace Darwin, F.R.S., will deliver an address. Lectures will be held fortnightly, the meeting place, as in former years, being the Royal Society of Arts, John Street, Adelphi.

The Committee are inviting applications from among the members for the position of secretary, which will shortly become vacant.

A number of accidents occurred on the first day. Maj. D. H. Chrissey, who had set out from San Francisco, was killed with his observer, Sergt. Vigil Thomas, when their machine crashed to the ground near Salt Lake.

Sergt. W. H. Neavitt, observer in a De Havilland flyer piloted by Col. Gerald C. Brant, was crushed to death when their machine fell at Deposit, N. Y., and Col. Brant was badly bruised.

A machine, carrying Mr. B. C. Crowell, Assistant Secretary of War, also crashed, but pilot and passenger were not hurt.

On Saturday Lieut. Maynard reached San Francisco, and unofficially his time is given as 75 hours 47 mins., while his time in the air was 24 hours 56 mins. Two competitors from San Francisco reached New York, these being Maj. Spatz, whose time was 83 hours 41 mins., and Lieut. Kiel, 83 hours 44 mins. All these machines were De H. 4's fitted with 400 h.p. Liberty engines.

Capt. Smith also arrived at New York on Sunday, the cause of his delay being a smashed propeller.

Announcement has been made that the start of the return journey has been postponed to October 20, but in the meantime it is rumoured that the race may be discontinued on account of the adverse weather conditions.

Detecting Flaws by the Camera.

ONE of the most fascinating sections of the exhibition now being held by the Royal Photographic Society at 35, Russell Square, W.C., is the series of photo-micrographs, showing how defects in aeroplane parts were detected, although quite invisible to the eye, and in some cases concealed by the linen wrappings. In one instance a strut had been cut off too short, and a false packing piece inserted; in another a wooden block was misshaped and split by the screws, and in yet another case extensive beetle borings were discovered. The exhibition will be open, free, daily, until Nov. 29.

SOME FRIEDRICHSHAFEN "MILESTONES"

PROBABLY no other German aircraft firm can show such a series of seaplanes as that produced by the Friedrichshafen Aircraft Works (Flugzeugbau Friedrichshafen) during the War, and for this reason a brief reference to the various types, illustrated by photographs, may not be without interest to readers of *FLIGHT*. The illustrations have been published in *Flugsport*, and the following is a translation of the descriptive matter accompanying the photographs:—

"The Friedrichshafen Aircraft Works is the oldest German firm which has devoted its energies almost exclusively to the production of seaplanes. The firm was founded in 1912 and has produced a great number of seaplane types, under the efficient leadership of its founder and managing director, Dipl. Ing. Theodor Kober, who has been ably supported by his associates, in close co-operation with the Naval authorities and with various scientific institutions. The main sphere of activity of the firm was the construction, testing, and quantity production of seaworthy single-engined seaplanes of the types used by the German Navy for reconnaissance flights over the North Sea and the Baltic. That the firm was successful in this is proved by the fact that they have been able to supply practically all the requirements of the German Navy, and that a number of other firms have built their machines under licence. Among these may be mentioned the Luftfahrzeug Gesellschaft, the Sablatnik Aircraft Works, the Gothaer Waggonfabrik and the Warnemünde Aircraft Works. As the seaworthiness of a machine depends not only on the right shape of float, but also upon the strength of the floats and undercarriage, on the correct amount of buoyancy and on controllability when alighting, it will be seen what an abundance of experience has to be collected in order to fulfil the specifications for a seaworthy seaplane. A large proportion of the experiments was formed by tests on floats, of which over 100 types were produced. The F.F. machines, which have been well proved during the War, are all of the twin-float type, although before the War single-float machines and flying boats were also tried.

"One object of the experiments was, among other things, to determine the number and placing of steps which best suited the different types of machines for starting and landing, and what float shape gave the best results for taxiing. At the same time the floats should combine small air resistance and great rigidity with small weight, while the most suitable, strongest, and lightest construction of float details also required much work and very many experiments. The following are the most important types of seaplanes produced by the Friedrichshafen Aircraft Works:—

" The F.F. 29

is a bomber with a 120 h.p. Mercedes engine (Fig. 1). The main floats are comparatively short, and a tail float is therefore fitted under the stern of the *fuselage*. The radiator is placed above the engine, and the exhaust pipes are passed under the lower plane. The pilot occupies the rear seat, while the observer sits in front, where are also the bomb releases. The petrol gravity tank is hung on the *cabane* struts.

" The F.F. 31

is shown in Fig. 2. It was a reconnaissance machine designed also to carry bombs. As the machine was required to have a free field of fire in a forward direction, the tail was carried on open tail booms and the Maybach (160 h.p.) engine was placed in the rear of the *nacelle* and drove a pusher airscrew. The observer was placed in front with his moveable machine gun, and the pilot occupied the rear seat. Behind the pilot was the radiator. As the main floats were also fairly short in this machine a tail float was fitted.

" The F.F. 33,

which is shown in Fig. 3, was fitted with a 120 h.p. Mercedes engine. It was a bomber of very similar design to the type F.F. 29, except for the floats, which were of considerably different shape.

" The F.F. 33B

was designed for reconnaissance and had a 160 h.p. Maybach engine (Fig. 4). It was similar to the 29 and 33 types in general design, but the pilot sat in front, the observer occupying the rear seat where was mounted on a gun ring a machine gun by means of which he could fend off attacks. The radiator is in two halves, mounted on each side of the *uselage*. While the floats of the F.F. 31 were provided with a Vee bottom nose, those of the F.F. 33B had a Vee bottom at the heel, and were flat-bottomed in front.

" The F.F. 33E,

shown in Figs. 5 and 6, was used for bombing and reconnaissance, with and without wireless. In general arrange-

ment it is similar to the 29 and 33 types. While the first machine of this type still retained the tail float (see inset Fig. 5) later machines were found not to require this on account of the long main floats with which they were fitted. The radiator was mounted on the leading edge of the top plane. Generally speaking, the *fuselage*, wing bracing, wings and *ailerons* were designed to give good aerodynamic efficiency.

" The F.F. 33F,

shown in Fig. 7, was a development of the 33. It was, however, designed as a fighter, and was probably the first to be successfully employed by the German Navy in various theatres of war. The wing area was considerably reduced, which resulted in greater manoeuvrability. The pilot sat in front, and the observer, who was provided with a machine gun mounted on a gun ring, occupied the rear seat. In addition to the substitution of the smaller wings, with only two pairs of struts on each side, this machine was altered later on by being fitted with a shorter and better stream line *fuselage*.

" The F.F. 33H,

which is shown in Figs. 8 and 9, was a development of the 33F. The *fuselage*, which was much shorter, was provided with a fin below as well as above, and the *ailerons* were redesigned to give smaller resistance. The radiator was built in flush with the top plane, which also contained the petrol gravity tank. The floats were also redesigned to give smaller air resistance. A great improvement in this machine was the incorporation of horizontal struts between the floats instead of cables, so that it was possible for the gunner to fire forward, between the inner pair of inter-plane struts and the propeller tips, since any damage accidentally done to the wing bracing in the inner bay was of minor importance as the load would be taken by the float tubes.

" The F.F. 33J.

"This type was fitted with a 150 h.p. Benz engine, and was used as a reconnaissance machine, fitted with wireless. It has been extremely successful, and has given excellent results during the War. The 33J (Figs. 10 and 11) is a direct descendant of the 33E. It is particularly seaworthy, is easy to fly, and very reliable, even for long-duration work. This machine is the first seaplane to be used successfully on all the seas of the world, and was used as a ship's plane on the *Wolf*. The main specification of the F.F. 33J is as follows: Weight, empty and without water, 2,300 lbs.; load, 1,185 lbs.; total weight, 3,485 lbs.; length overall, 34 ft.; span, 55 ft.; float capacity, 61 cu. ft.; speed, 71-77.5 m.p.h. according to load; speed when taking off, 50 m.p.h.; climb to 4,950 ft. in 25 mins.; duration, 5 hours. This type is, so to speak, unbeaten in any theatre of war, as it was purely for military reasons that the 33J was supplanted by machines of 200 h.p. Owing to its proved capabilities the type was retained as a practice and school machine, in which form it was known as

" the F.F. 33S.

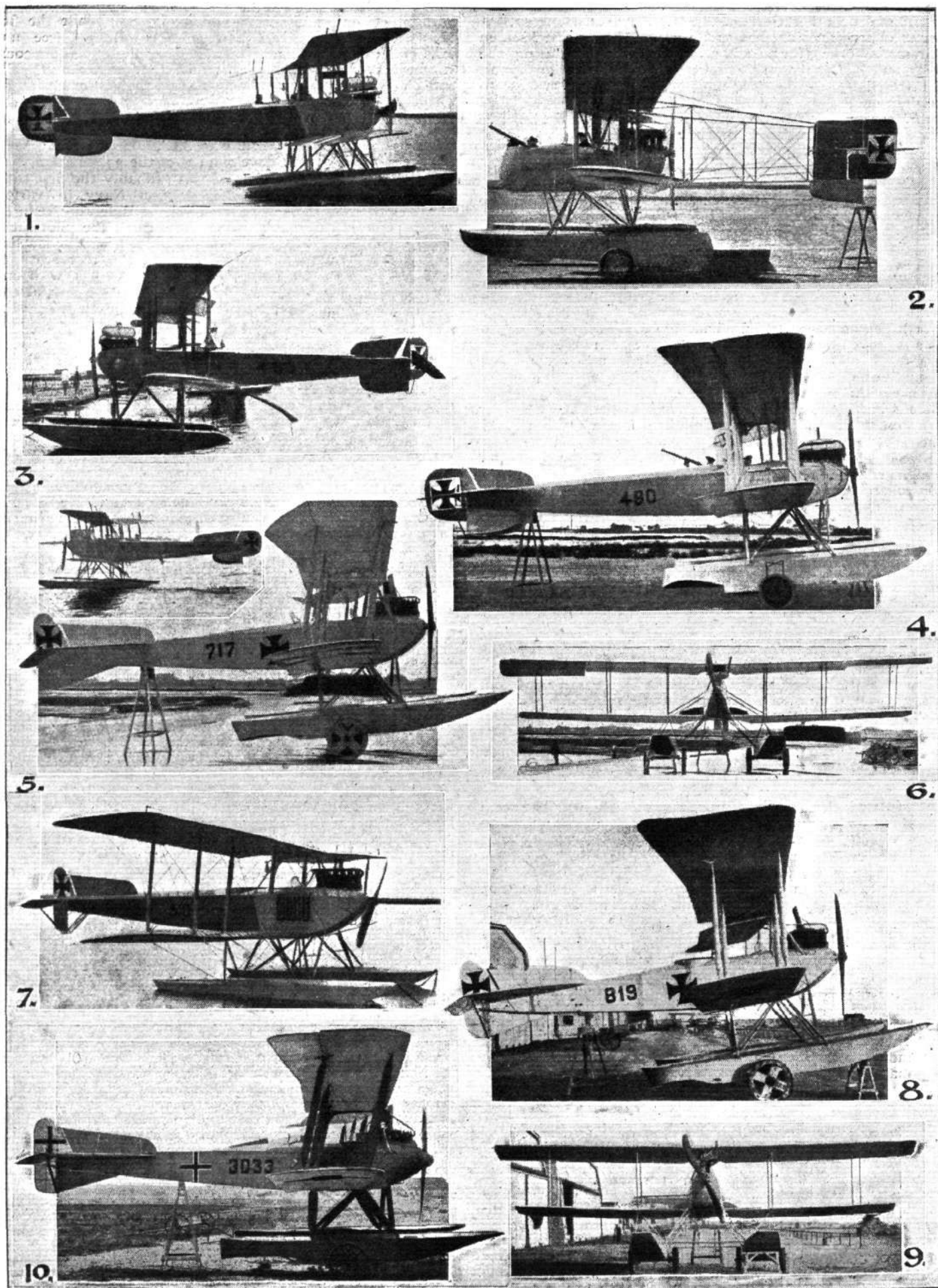
"During the last years of the War practically all the German seaplane pilots were trained on this type (Fig. 12), and nothing more need, therefore, be said about its utility as a practice and school machine.

" The F.F. 33L.

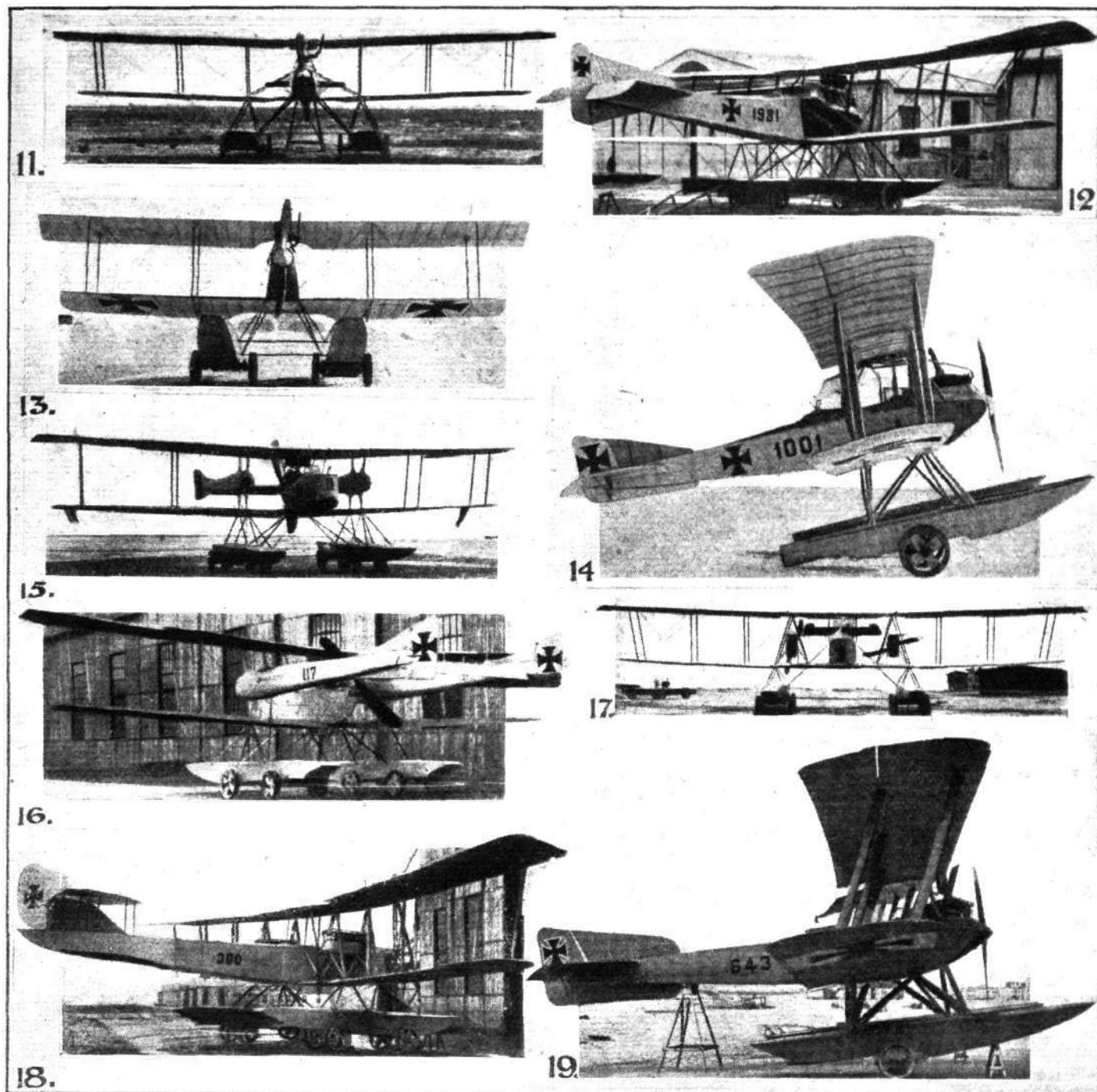
"This machine, which is shown in Figs. 13 and 14, is a further development of the 33H. It is fitted with 150 h.p. Benz or Mercedes engines. It formed a very happy compromise between the demands for seaworthiness and for performance. In accordance with its use as a fighter the 33L possesses great manoeuvrability, and is very seaworthy in any sea up to a roughness degree of 3. It is easy and comfortable to fly. Its main characteristics are: Weight, empty and without water, 2,070 lbs.; load, 1,045 lbs.; total weight, 3,115 lbs.; length overall, 30 ft.; span, 43 ft. 6 ins.; float capacity, 49 cu. ft.; horizontal speed, 80 to 86 m.p.h.; climb, 6,600 ft. in 30 mins.; duration, 3½ hours. This machine was equipped with one movable and one fixed machine gun, or one movable gun and a wireless outfit.

" The F.F. 34

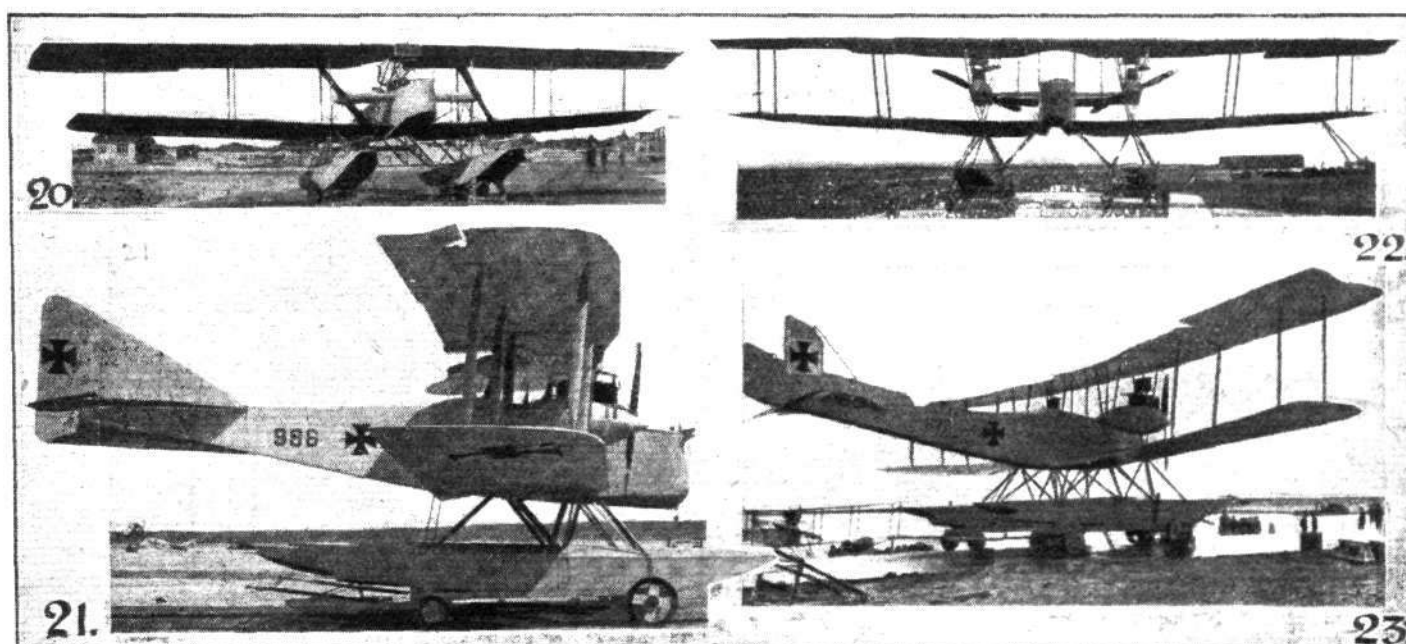
is of the pusher type, like the 31, but it has two plywood *fuselages* carrying the tail instead of the open tail booms of the 31. The machine, which is shown in Figs. 15 and 16, was fitted with a 240 h.p. Maybach engine, and as the engine was placed in the rear of the *nacelle*, the field of fire in a forward direction was very good. It was used as a reconnaissance machine, and was equipped with wireless. Figs. 17 and 18 show



THE FRIEDRICHSHAFEN SEAPLANES: Figs. 1 to 10



THE FRIEDRICHSHAFEN SEAPLANES: Figs. 11 to 19



THE FRIEDRICHSHAFEN SEAPLANES: Figs. 20 to 23

" the F.F. 35,

which was fitted with two Mercedes engines of 150 h.p. each. This was the first twin-engined seaplane turned out by the Friedrichshafen Aircraft Works. One of the features of this machine was the method of mounting the engines. As will be seen from the illustrations (Figs. 17 and 18), the engines were supported by a framework of struts from the bottom plane, and the engine mounting is independent of the wing truss. The stern of the fuselage was built of three-ply wood, and had a Vee bottom in order to act as a tail float, the Vee bottom lessening the shock of the tail coming in contact with a rough sea. In order to protect the tail plane and elevator against the sea the tail plane is mounted on top of the vertical fin and braced by struts. During a number of flights the 35 has proved itself a very good machine. Another remarkable feature of this machine is that all metal fittings in the wings, fuselage and floats were made from solid steel by forging, milling, drilling and planing. Starting handles were provided in front of the radiators.

" The F.F. 39C.

" As a result of the ever-increasing military demands, the reconnaissance machine type F.F. 33J, which was fitted with a 150 h.p. Benz engine, and which had already done extremely good work, had to be replaced by the F.F. 39C, which was fitted with a 200 h.p. Benz. Generally speaking the construction of the 39C was similar to that of the 33J, but on account of the larger engine, the dimensions were increased. Also the floats were of a different form (Fig. 19). The stagger was somewhat greater than that of the 33J, and various details were different so as to combine light weight with small resistance.

" The F.F. 40.

" This was a very interesting experimental machine, fitted with a 240 h.p. Maybach engine driving two tractor screws placed between the planes (Fig. 20). The performance and general handling of this machine were good, but the transmission was too heavy in proportion to the engine power.

" The F.F. 41A.

" As a consequence of the good results obtained with the Friedrichshafen land machines of the G type, and with the first F.F. twin-engined type seaplane, the 35, the F.F. works received from the Naval authorities instructions to proceed with the design and construction of twin-engined seaplanes specially designed for dropping torpedoes. Of these the F.F. 41A has done particularly well. This machine, which is shown in Figs. 21, 22 and 23, was fitted with two 150 h.p. Benz engines. As a result of the experience with the large F.F. land machines, the engines were mounted between inter-plane Vee struts, which arrangement was found to combine great reliability with small weight and low air resistance. The chief characteristics of the F.F. 41A are as follows: Weight, empty and without water, 5,050 lbs.; load, 3,000 lbs.; total weight, 8,050 lbs.; length overall, 45 ft.; span, 72 ft. 6 ins.; float capacity, 135 cu. ft.; horizontal speed, 71 to 77 m.p.h.; speed on taking off, 52.5 m.p.h.; climb to 3,300 ft. in 25 mins.; duration, about 5 hours. The machine is easy to fly, and also possesses good seaworthiness. On account of its large span it is not, of course, so handy as a single-engined machine.

(To be concluded.)

THE SHIPPING EXHIBITION

THOSE who have not yet visited the Shipping and Engineering Exhibition at Olympia have still an opportunity of doing so, as, on account of the railway strike, it has been decided to keep it open until October 21. While, it is true, that the aeronautical industry is not directly represented, those who are interested in that branch of engineering will find much to engage their attention, apart from the fact that many names, such as W. Beardmore and Co., Boulton and Paul, Vickers-Petters, etc., are familiar. What is applicable to one department of engineering may often be adapted with advantage to use in another branch, and, anyway, it is always useful to keep in touch with the latest developments. The building of ships calls for handicraft in both wood and metal, and as aircraft are produced from the same materials, it is unnecessary to emphasize how much the aircraft engineer can learn by a tour of inspection of the stands in Olympia.

Those whose business is with the building of aircraft will be naturally impressed by the many exhibits concerned with welding, a process which has been largely used in connection with the making of aeroplane fittings and what makes these stands more than usually instructive is that the actual process of metal fusion or the cutting through of thick plates can be watched through specially coloured screens which cut out the injurious rays of light.

Among the stands may be mentioned those of the Dissolved Acetylene Co., Ltd., Carbic, Ltd., the British Oxygen Co., Ltd., Thorn and Hoddle Acetylene Co., Ltd., who give demonstrations of their oxy-acetylene systems, while on the stand of the Alloy Welding Processes, Ltd., electric welding sets are shown in operation.

Another stand which is of great interest to the manufacturer is that of the McGruer Hollow Spar Co., Ltd., whose products have proved so efficient for longons, struts, etc. They were used on five out of the eleven entrants for the Transatlantic flight, and were actually fitted on Sir John Alcock's Vickers-Vimy-Rolls. The Aluminium Plant and Vessel Co. show a most varied assortment of sand and die castings in aluminium, and the display of the Smethwick Stamping Co. indicates what can be done by them in the way

of high-grade drop-forgings and stampings. The Galvanising Equipment Co. have samples of galvanised material which illustrate the advantage of their Galeco process, and their exhibit also includes the Cropley heating and drying set, delivering air free of combustion products at all temperatures up to 400° F.

The Herbert Frood Co., Ltd., who are more familiar as the makers of Ferodo, show a number of applications of their material to engineering purposes. The North British Rubber Co., Ltd., have on view a comprehensive display of their rubber manufactures, including hose, mats, boots, shoes and gloves, waterproof clothing, etc. Apart from their Valor chemical fire extinguisher the Valor Co., Ltd., show many of the accessories they produce for works' use, such as heating stoves, storage cabinets, petrol cans, oil filters. The stand of F. Pratt and Co. is another stand which will appeal to the manufacturer, as this firm show chucks, of British manufacture, for practically every conceivable purpose. The Aerograph Co., Ltd., show samples of the work done by their spraying apparatus for applying liquid coatings to surfaces, including enamelling, varnishing and polishing. Coatings of all types are seen on the stand of Pinchin Johnson and Co., Ltd., which is a veritable showcase of the firm's products, as varied as they are beautiful.

The Gledhill-Brook Time Recorders demonstrate their systems of recording workmen's time, costs, etc., and their exhibit also includes a mass of informative detail with regard to time-checking and saving appliances.

Messrs. C. C. Wakefield and Co. exhibit under working conditions various types of the Wakefield mechanical lubricator and lubricants, for many different types of plant can be seen together with the chemical apparatus used in testing and research work on oils, as well as plant for waste elimination and general apparatus as applied to the Wakefield system of lubrication.

Two stands which never fail to attract are those of the Marconi Co., on which are seen at work various types of transmitters and receivers. A wireless telephone set connects the two stands, which are at opposite ends of the buildings.

Air Work in the Caspian

In a dispatch from Rear-Admiral M. Culme-Seymour, C.B., published in the *London Gazette* of October 9, dealing with operations in the Caspian Sea, it is stated that in dealing with the Bolshevik force the naval units were assisted by an air unit under Lieut.-Col. Bowhill, D.S.O., which made its first raid on April 21. In the attack on Alexandrovsk, on May 21, good work was done by the aircraft, five bombing raids being carried out in one day by a single seaplane working from a seaplane-carrier.

Admiral Culme-Seymour draws attention to the good work of the following officers of the R.A.F. who between them carried out five raids in one seaplane on the same day with excellent results, and attempted a sixth, and also the services of Lieut. Chilton, R.N.R., commanding *A. Yousanoff*. Pilots: Sec. Lieut. Howard Grant Thompson, Capt. John Archer Sadler, and Sec. Lieut. Robert George Kear Morrison. Observers: Lieut. Frank Russell Bicknell, Sec. Lieut. Frank Leslie Kingham, and Sec. Lieut. Henry Godwin Pratt.

AIRISMS FROM THE FOUR WINDS

LEVELLING down in regard to the Air Service seems to be the slogan this side the herring-pond, while across yonder it is a case of levelling up. Last week the U.S. Senate Military Committee recommended an additional appropriation of 15 million dollars for Army aircraft construction in connection with the establishment of air routes to Panama, Alaska and probably Asia.

AND further, when one sees the Chinese Government plumping for progress in aerial work by placing a two million sterling aeroplane order with Messrs. Vickers, Ltd., why it makes one wonder whether this may be the first move in the "Yellow Peril" breakaway so long forecast.

AMONGST those Hun criminals who will be claimed for trial by the Supreme Council on behalf of Britain, for committing acts of violation of recognised rules of warfare, it is now authoritatively stated, will be a number of pilots in charge of the Zeppelins and aeroplanes which bombed London. So mote it be.

LOOKS as if at last action were being taken in connection with the aircraft activities in neutral countries of Germany. It is stated that on Monday the Supreme Council in Paris directed Marshal Foch to warn Germany that the sales of aeronautical material in Sweden are considered null and void by the Allies, because they are contrary to the stipulations of the Treaty of Peace.

NOBODY ever took seriously the Hun claim that the first act of war in 1914 was perpetrated by France in the sending of war planes over German territory for spying and aggressive purposes. As this *casus belli* has been so categorically set out from the first, it is surprising that no explanation and an equally categorical denial has been forthcoming long since. From a Paris report to hand some light is now let in upon this "made in Germany" concoction. The exact War lie circulated was that on the eve of the War a French aeroplane had bombed Nuremberg. On Wednesday of last week, at a Court-Martial in Paris, an explanation of this plausible excuse for hostilities was forthcoming; It was in the case of M. Unné, an engineer of a motor company, who last year was sentenced *in contumaciam* to five years' imprisonment and a fine of 27,210 fr., and the loss of civic rights, for having, it was alleged, sought to bribe receiving officers of the Aviation Corps. M. Unné was in America at the time, and knew nothing about the charges against him. He explained at the Court-Martial that towards the end of July, 1914, a Salmson aeroplane, piloted by M. Laporte, set out from Paris to attempt a flight to Constantinople, and win the Municipal Council Prize of 10,000 fr., and the Pommery Cup Prize of 60,000 fr. While he was flying over Bavaria, his motor broke down, and M. Unné was sent from Paris to mend it. The German authorities, however, threw obstacles in the way of a fresh start, and it was not till August 1 that they were granted

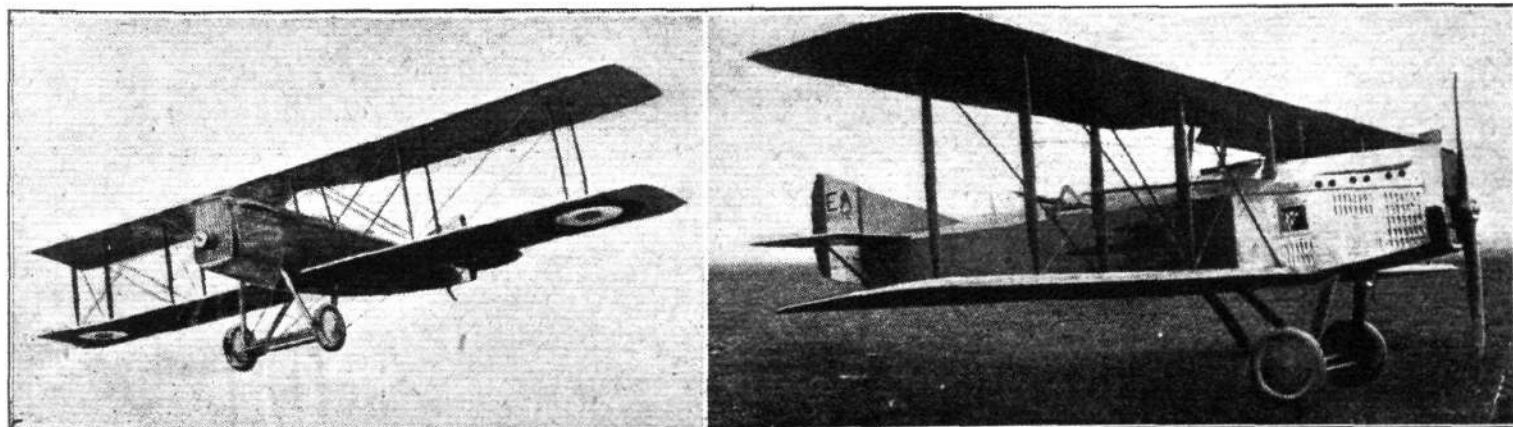
permission to continue the flight, on condition that M. Laporte should follow a fixed itinerary leading him over Nuremberg. As the aeroplane passed above the latter town it was fired at. Immediately afterwards the fictitious *casus belli* was wirelessly by the Germans throughout the world. It is somewhat unfortunate that M. Laporte is no longer alive to confirm this story, having lost his life in a fall outside Paris in January, 1915. It is well that the Court-Martial acquitted M. Unné.

HAVING regard to the development of flying, it seems an absurdity that attempts should still be made to establish possibilities for the "Aviette," or humanly-propelled "cycle-plane." What earthly good can be achieved by demonstrating that some particular man can accomplish a glorified jump when riding a push-bike with a plane or two added to its structure, passes comprehension. But in Paris there seems still to be a fascination to persevere. It will be a good job when the Peugeot prize of 10,000 fr. offered for "flying" 10 metres in two directions in a machine worked by human propulsion, is won. In all probability, to "lift" this sum of money is the real object of the continued efforts to "lift" a push-bike into a 10-metre jump. Therefore we are not over-much disgruntled at seeing that the Paris authorities are upon a side-issue trying to stop this sort of fooling, they having served Poulain, the French cyclist, who has been unsuccessfully trying to "lift" this 10,000 fr. prize, with a summons for riding in a city garden to the public danger. "Avietting" is not aviation.

Autres temps, autres mœurs. Curious how consistently the uncanny of today becomes the commonplace of tomorrow. Fortune-telling is no new fable. It has existed for all time. It is only in its application and its utilisation of modern science that it differs as the ages pass. Only last week one Ellen Lucy Bloodwort was arraigned before the South-Western Police Magistrate upon a charge of fortune-telling, the case being dismissed by the magistrate, as he was satisfied that "the accused believed she had the power of foretelling the future." That is the whole point. After all, many a person has in past dark days been burnt at the stake for less foretelling of events than the flying for a thousand or more miles at a stretch. And so in this case, presumably, Mr. Bankes' full judgment given below is worth noting under the circumstances, although we think had he brought airships into a 20 years' category instead of the 100 years' period, we think he would have been much nearer the mark, as may be judged by the following:—

"Mrs. Bloodwort is charged under the Vagrant Act of 1824 as a rogue and vagabond, an Act passed 100 years ago, when anyone who talked about railways, telephones, airships, or votes for women would have been looked upon as a lunatic. It is not for me to express any opinion upon spiritualism, or whether it is a delusion or not. All I have to decide is whether the case comes within the section.

"A decision was given in 1918 in the High Court Davis



Two views of the French S.E.A. two-seater biplane, which has a speed of 129 m.p.h. at 6,500 ft., and climbs to 17,000 ft. in 21 mins. It is fitted with a 390 h.p. Lorraine-Dietrich engine, and has a span of 39 ft. 5 ins., an area of 404 sq. ft., and a loading of 8.4 lbs./sq. ft.

Case which I must follow. In that case Mr. Justice Avory was of opinion that fortune-telling was of itself an offence. I must say I agree with him; but I must follow the decision of the Court, Justices Darling and Sankey, who held that evidence of belief on the part of the medium must be received and acted upon if believed. I am absolutely satisfied that she believes she has these powers. Whether I believe it or not does not matter; so I shall dismiss the summons."

A propos fortune tellers, according to official statistics quoted by the *Petit Parisien* there are in Paris 35,000 clairvoyants, fortune-tellers, and seers of various kinds, who, on the whole, do a very good business. These days, almost numerous enough to start a fortune-tellers' union.

WHILST our Post Office authorities are boggling over giving aerial post a reasonable trial in actual practice, an aeroplane object lesson is recorded by Mr. Percy G. Donald, of Upper Thames Street, of not only the postal service being bettered, but of our wonderful telegraph service being beaten to a frazzle. Here is what Mr. Donald writes:—

"I have just returned from the Balkans to find out the exact details of an incident connected with aeroplane service in comparison with the telegraph.

"On leaving London I found I had left the keys of my baggage behind. I telephoned through to London for an endeavour to be made to send them on by aeroplane, as I was leaving Paris the same night for Rumania.

"The keys duly arrived and were delivered to me within four hours from the time at which they left London, together with a letter stating that my firm had 'telegraphed me that the keys had been despatched.'

"The telegram announcing that the keys had left arrived in Paris late on the following day!

"Surely this question of telegraphic delays is one which might suitably be dealt with at once by the Postmaster-General in connection with the aeroplane service

"By the use, we will say, of the telegraphic messenger service with district offices in London and in Paris, it would be possible to send letters to Paris at a nominal charge, ensure that they would get through within six hours of the despatch from London, and thereby in turn considerably relieve the telegraphic department, which apparently is incapable of

carrying out the service which its acceptance of telegraphic payment involves."

A PRETTY sequel to the Transatlantic voyage of R 34 was the reception by the Queen at Buckingham Palace last week of Miss Lizzie Chestnut, a Glasgow worker upon the airship at Inchinnan. Miss Chestnut, who was presented to Her Majesty by Lady Sybil Grant, handed to the Queen, on behalf of her fellow-workers, a replica of the figure-head of R 34 in the form of an aluminium shield, bearing the Lion of Scotland and the airship's motto, mounted on mahogany.

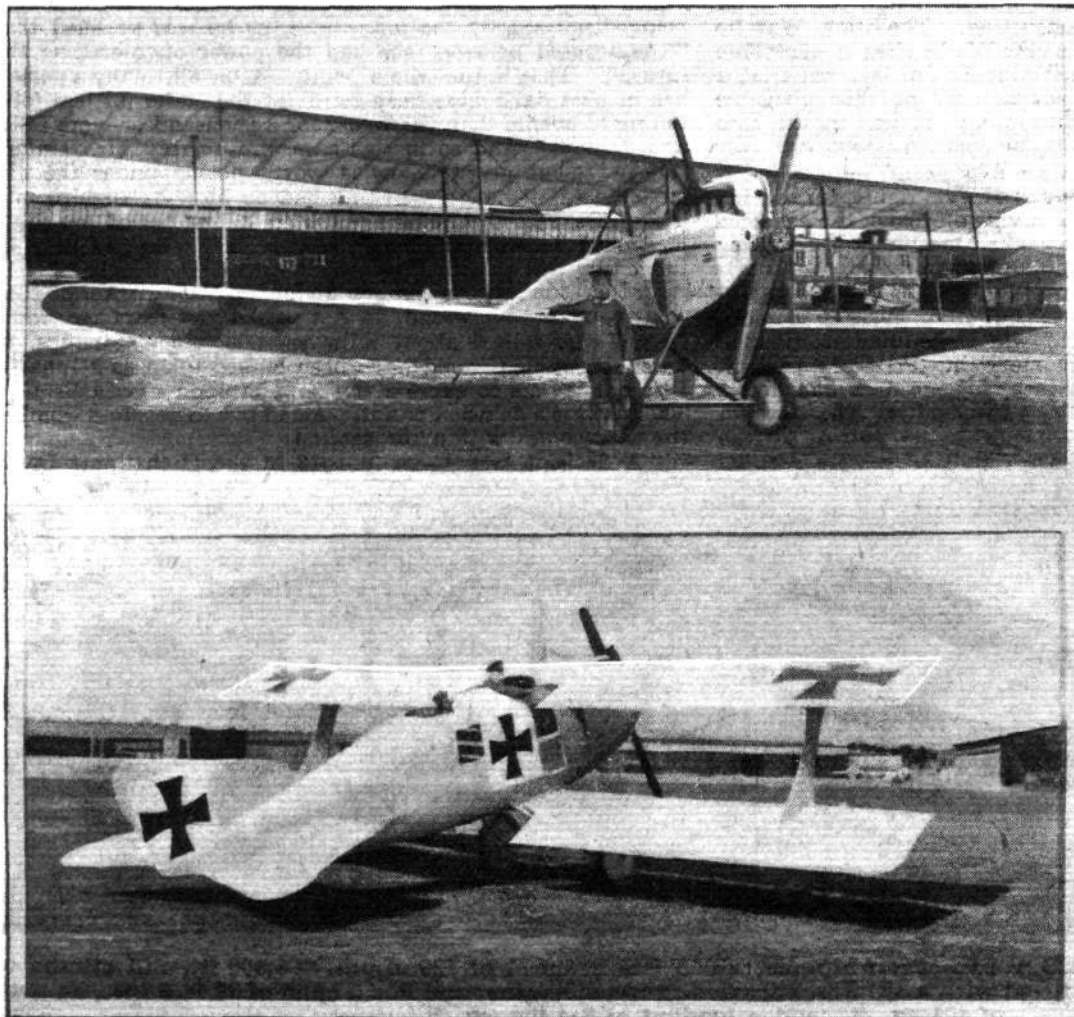
ANOTHER pleasant incident and well judged recognition likely to help in the estimate of the duties of life, also stands to be recorded last week. In Ravenscourt Park, Hammer-smith, the Mayor, Alderman H. Foreman, M.P., presented 20 silver medals to boy scout buglers who sounded the "All Clear" after air raids in the borough.

It is with regret we hear that it has been necessary for Lady Sybil Grant's medical advisers to order her complete rest, even to receiving no correspondence. Lady Sybil's strenuous airship work at the Admiralty during the War, followed by her great efforts to ensure success to the Airship Exhibition at Princes' Galleries, is no doubt responsible for this result, which we hope may be but of a very temporary character.

GENERAL LUDENDORFF, in "My War Memories, 1914-18," just published by Hutchinsons, lets in some light upon Hun developments of attacks by aircraft, which fortunately never developed, upon Paris and London. In this book it emerges that in the summer of 1918 the German chemists had placed in the hands of the Headquarters Staff bombs of deadlier potency than have ever been devised by the destructive wits of man. The only reason why these devices of the devil were not employed against the French and English capitals was that their use would not have saved the already beaten German army, and would have meant attacks on German towns by the airmen of the Allies.

General Ludendorff, surveying the prospect of the fearful fire-bombs in August, 1918, writes:—

"Our position was now so serious that G.H.Q. could not hope that air raids on London and Paris would force the enemy to make peace. Permission was, therefore, refused for the use of a particularly effective incendiary bomb, expressly



Two types of Hun fighters. At the top the D.F.W.C.V. 200 h.p. Benz, and below the Roland (L.F.G.) C.11 160 h.p. Mercédès, both two-seaters

designed for attacks on the two capitals, sufficient supplies of which were ready in August. The large amount of damage that they were expected to do would no longer have affected the course of the War. Destruction for its own sake had never been permitted. Count Hertling, too, had requested G.H.Q. not to use these new incendiary bombs on account of the reprisals on our own towns that would follow."

LUDENDORFF it would seem, however, was too farseeing a man to resort in the eleventh hour of Germany's approaching doom to these terrible burners of cities. He endeavoured, however, to "carry on as usual" with the raids with which Germany had gradually familiarised the world. In the late summer and autumn of 1918 it was thought that the decreasing raids on London were due to German policy. The true reason, now revealed by General Ludendorff, was that the climatic conditions were against German success in these aerial attacks.

"I retained the policy of ordinary raids on London and Paris," he said, "in order to keep enemy anti-aircraft material far from the front, and to prevent the troops noticing the reduction in our strength, but I no longer pressed matters. Only a few more small raids were made on Paris, while London could not at this time be reached owing to adverse weather conditions."

Possibly the "welcome" which the raiders of London received at the hands of General Salmond and his organisation may have had something to do with this magnanimous state of mind brought about in the commander and his co-conspirators at German G.H.Q.

MRS. GEORGE RENWICK'S interesting experiences in a Zeppelin Pullman car during a journey from Berlin to Friedrichshafen, recorded in the *Chronicle* the other day, give a very vivid impression of an aerial voyage under modern luxury conditions. One item included in her narrative we are just wondering about. She gives the luncheon menu served on "a small red shelf hooked across the front of my armchair." It is as follows:—

Strasbourg goose-liver	15s.
Box of French sardines	12s.
Liver pasty	8s.
Plate of mixed cold meat	12s.
Westphalia ham	14s.

AIR CARNIVAL AT BRIGHTON

ON Saturday, 11th inst., the Avro Co. organised an air carnival at Brighton on a scale not previously witnessed, at least in the south of England. At 10 a.m. eight Avros started from Hounslow in close formation under the command of Maj. McMinnies and Maj. A. G. Taylor. The mist was thick in the morning, but they flew comparatively low across country, and at Brighton joined forces with the Avros already there under the charge of Capt. Kennard. The other pilots who took part in the display were Capts. Davis, and Le Blanc Smith and Messrs. Park, Sadler, Sullock, Broad, Pitt, Sparks and Weeks.

The Ladies' Mile at Patcham had not proved a very convenient aerodrome, and a much better one had been secured at West Blatchington Farm, easily reached by road or rail from both Brighton and Hove. Admission to the ground was free, and a huge crowd had collected to witness the display.

The carnival commenced at noon, and the show put up by the pilots was perfectly magnificent. The air was thick with aeroplanes in every conceivable position—straight (occasionally), upside down, on their sides, on their tails, on their noses, spinning, diving, climbing, looping and turning. The roar of the engines drowned the cheers of the crowd, as they gazed wide-eyed at the bewildering sight.

A special thrill was provided by three descents from aeroplanes made with Guardian Angel parachutes—one by Miss Nellie Gibson and two by Professor Newall, the second being a double one.

Next day the whole performance was repeated. Several showers of rain came on, but they did not stop the aeroplanes

Commercial Aviation in South America

AMONG the interesting items in Brazil's budget for 1920 is the setting aside of the necessary funds to establish an aerial postal service.

It is announced from Buenos Aires that a Franco-Argentine aerial transport company has been formed there.

Jansen Wins the Deutsch Cup

ON Tuesday Jansen on a new Nieuport monoplane succeeded in winning the Deutsch Cup, covering the 190.4



The Pop and the Dirigible Hangar—Fontaine Fox in the N. Y. Globe

Salad	2s. 6d.
Small roll sandwich	4s.

What has set us wondering is whether Mrs. Renwick really managed to get through the little list of things provided for her £3 6s. 6d., even if washed down with a 38s. bottle of champagne, as it may suggest aerial voyages as an antidote to those blase *nouveaux riche* folk who have lost their appetites.

from flying or damp the enthusiasm of the crowd. Professor Newall showed great skill in manipulating his Guardian Angel parachute through a 20-mile wind. Many indulged in ordinary flights and enjoyed views of the aerobatics from the same level as the manœuvring machines. On one occasion a man of 85 and his granddaughter, a grown woman, made a flight together in the same machine. It was a splendid wind-up to the season, and the enthusiasm of the crowd and the number of applications for passenger flights showed that the work of the Avro Co. at various places has, without doubt, opened the eyes of the public to the advantages and possibilities of aviation.

WINDERMERE-DOUGLAS FLYING

THE Avro seaplane season has now finished on Lake Windermere. Last Saturday Capt. Pixton flew a machine over to Douglas to escort Mr. Moxon back on his land machine. He made two journeys from Windermere to Douglas, and also alighted at Blackpool to pick up Mr. Moxon and take him back to fetch the second machine. The weather was perfect except for a thick mist, which made it difficult to find the way.

On Wednesday Capt. Pixton called at Blackpool by car and brought Mr. Moxon back to fly one of the seaplanes to Blackpool, where it was to be fitted with a land chassis. On arrival at Blackpool, it was found to be impossible to fit the land chassis without a lot of alterations, so Moxon flew the machine back to Windermere the next day, having to take off in a very rough sea.

All's well that ends well.

kiloms. of the Meaux, Melun, Senlis course in 56 min. 55 secs., an average speed of 200.655 kiloms. an hour. Sadi Lecoq started on an attempt, but owing to trouble with his motor, was obliged to land at Jurisy.

A Handley Page in the U.S.

ON October 10 the Handley Page machine, piloted by Maj. Brackley, and including Admiral Kerr among its 12 passengers, flew from Parrsboro (Nova Scotia) to Greenport, Long Island, and on the following day it went on to Mineola.

THE ALTITUDE LABORATORY FOR THE TESTING OF AIRCRAFT ENGINES

BY H. C. DICKINSON AND H. G. BOUTELL

[During the War aircraft design has made such enormous progress that we can now be said to have reached a stage when there is little hope of any very great improvement in the performance of aeroplanes. Progress there will be, undoubtedly, but it will be chiefly in the matter of reliability, and only to a relatively small extent can the performance be expected to improve. There is one field, however, which we had really barely commenced to touch when Peace was signed, and which would appear to offer very great possibilities, especially as regards very long flights. We are referring to problems connected with flying at great altitudes. It is, of course, a well-known fact that as the altitude increases the power of an aero engine drops off, unless means are provided for insuring that the engine gets a full charge of air into its cylinders so as to receive on each induction stroke the same weight of air as it is getting at the ground level. It will be seen that if the engine power can be maintained, and the screw efficiency also, a machine will be able to travel very much faster at a great height, owing to the lesser density—and, consequently, smaller resistance—of the air. It is already fairly well known that in America a considerable amount of research work has been done relating to this subject, and that the Bureau of Standards (which corresponds to our National Physical Laboratory at Teddington) has had constructed an "Altitude Laboratory" in which aero engines can be tested under conditions that are practically identical with those obtaining in the rarefied air at great altitudes. As we consider the subject is one that will play a very important part in the development of long-distance flying, we have thought that a description of the American Altitude Laboratory and the results of some of the tests carried out there would be of more than passing interest to readers of FLIGHT. In the present and subsequent issues we, therefore, publish some of the reports dealing with this Laboratory and with the tests carried out, advance copies of which have very courteously been placed at our disposal by the Director of the U.S.A. Bureau of Standards.—ED.]

Introduction

A brief description of the Altitude Laboratory constructed at the Bureau of Standards for the National Advisory Committee for Aeronautics was published in the third annual report of the Committee. This description was prepared shortly after the equipment had been completed, and before a sufficient number of observations had been made to much more than demonstrate the practicability of operating aeroplane engines in a test-chamber at any desired air pressure and analysing their performance. Since the preparation of that report the laboratory has been in continuous service for more than a year, except for the occasional delays incident to the usual minor revisions of apparatus and perfecting of means and methods of observation to be expected in any new research work. It may be stated, without reservation, that the laboratory has fully justified the most sanguine expectations as to its practicability, and has already yielded results of much importance.

Factors in Engine Performance Studied in the Altitude Laboratory

The principal factors in engine performance—aside from general reliability and useful life, which can be determined only from statistics of performance of a large number of engines—are as follows:—

(1) Horse-power and brake mean effective pressure at full throttle for:—(a) All air pressures down to the lowest to be encountered in flight. (b) All air temperatures to be expected. (c) All operating speeds. (d) Different grades of fuel. (e) Various petrol-air proportions. (f) Various spark settings. (g) Various jacket water temperatures. (h) Various oil temperatures. (i) Various back pressures on the exhaust.

(2) Horse-power and brake mean effective pressure at part throttle, under the same conditions as (1).

(3) Mechanical losses:—(a) Total mechanical losses at operating speeds under any condition mentioned in (1) and (2) with full and part throttle. (b) Elements of mechanical loss, including friction of bearings, friction of piston on cylinder walls, pumping losses, and variation of these losses with oil temperature or viscosity.

(4) Heat distribution, including the following:—(a) Total heat of fuel. (b) Heat equivalent of brake horse-power. (c) Heat loss in jacket. (d) Heat loss in exhaust. (e) Heat loss in direct radiation. (f) Heat gain in combustion of lubricating oil. (g) Heat lost through mechanical friction. The dependence of these quantities on:—1, air density and temperature; 2, engine speed; 3, mixture ratio (fuel to air); 4, atomisation of fuel; 5, composition of fuel; 6, throttle opening.

(5) Fuel consumption, depending upon:—(a) Air density. (b) Air temperature. (c) Engine speed. (d) Throttle opening or power output. (e) Carburettor adjustments for maximum power, or for maximum economy. (f) Miscellaneous operating conditions.

(6) Exhaust gas analysis:—(a) Quality of exhaust for the different operating conditions listed in (5).

(7) Pressure distribution in power stroke:—(a) As affected by engine operating conditions at various air densities and with fuels of different compositions and with various timings of the ignition.

(8) Oil consumption.

(9) Oil deterioration.

(10) Carburettor performance:—(a) Compensation for variations in atmospheric pressure. (b) Compensation for throttle changes. (c) Compensation for varying air temperatures. (d) Idling and acceleration characteristics.

(11) Supercharging devices as applied to engines.

(12) Low air pressures and temperatures as affecting general performance of engines and miscellaneous accessories.

The Altitude Laboratory has been designed and equipped to supply data concerning most of the foregoing factors.

Provisions for Controlling Operating Conditions

The conditions of air pressure and temperature, as well as humidity if necessary, can be varied and controlled at will to simulate conditions at altitudes as high as 30,000 ft.; the pressure being independently controlled at the intake and exhaust of the engine, as well as in the test-chamber.

Temperature of the jacket-water is controlled either automatically or by hand; and oil temperatures can be regulated by means of special arrangements adapted to the particular engine under test.

Engine speed and load are controlled by means of an electric dynamometer, combined with a water brake to care for excess load. Mixture ratio, spark setting, etc., are adjusted in the usual manner from outside the chamber.

Provisions for Measurement

Torque and speed are measured by direct methods, while fuel consumption is determined by direct weighing, with a rate of flow meter for convenience. Separate weighing tanks are provided in order to compare different fuels.

Rates of water flow are measured at the following points by means of calibrated venturi meters:—(a) In the water-jacket line, measuring water circulation through the cylinder-jackets. (b) In the line supplying cooling water to the exhaust, permitting measurement of the heat in the exhaust. (c) In the line supplying cooling water to the oil cooler, permitting measurement of the heat in the oil.

Rate of air flow to the carburettor is measured by means of a large venturi tube, which has been compared with a Thomas meter, the latter also having been used for metering the intake air. Where the carburettor design permits of it, measurements of air flow can be made by previous calibration of the carburettor choke in the carburettor test plant at different air densities. This is a newly developed method which offers promise of excellent results.

The rate of oil flow is to be measured in special cases by oil venturis, but these have not yet been completed.

Pressure measurements are made at numerous points, depending upon the special problem in hand. For this purpose, there are provided an adequate number of copper tube connections running from the chamber to a gauge board on the outside, which is fitted with glass "U" tubes for use with mercury or water, as may be required. This gauge board is described in detail in a subsequent paragraph.

Measurements of maximum compression pressure and maximum explosive pressure are made by two different types of pressure-indicators, which give very satisfactory check results. No satisfactory measurements of cylinder pressures, other than maximum pressures have yet been made. Much time has been devoted to the perfecting of a satisfactory pressure-indicator. This device has now reached the stage

of trial observations, and promises good results. None of the several pressure-indicators on the market can be readily adapted to use on an engine in a closed test-chamber, where the indicator cannot be reached by the operator. The design under construction is adapted to this condition.

Temperature measurements are all made by means of calibrated thermo-electric couples, which in the hands of a skilful observer can be relied upon to an accuracy of 0.1°F ., or much better than this if occasion requires.

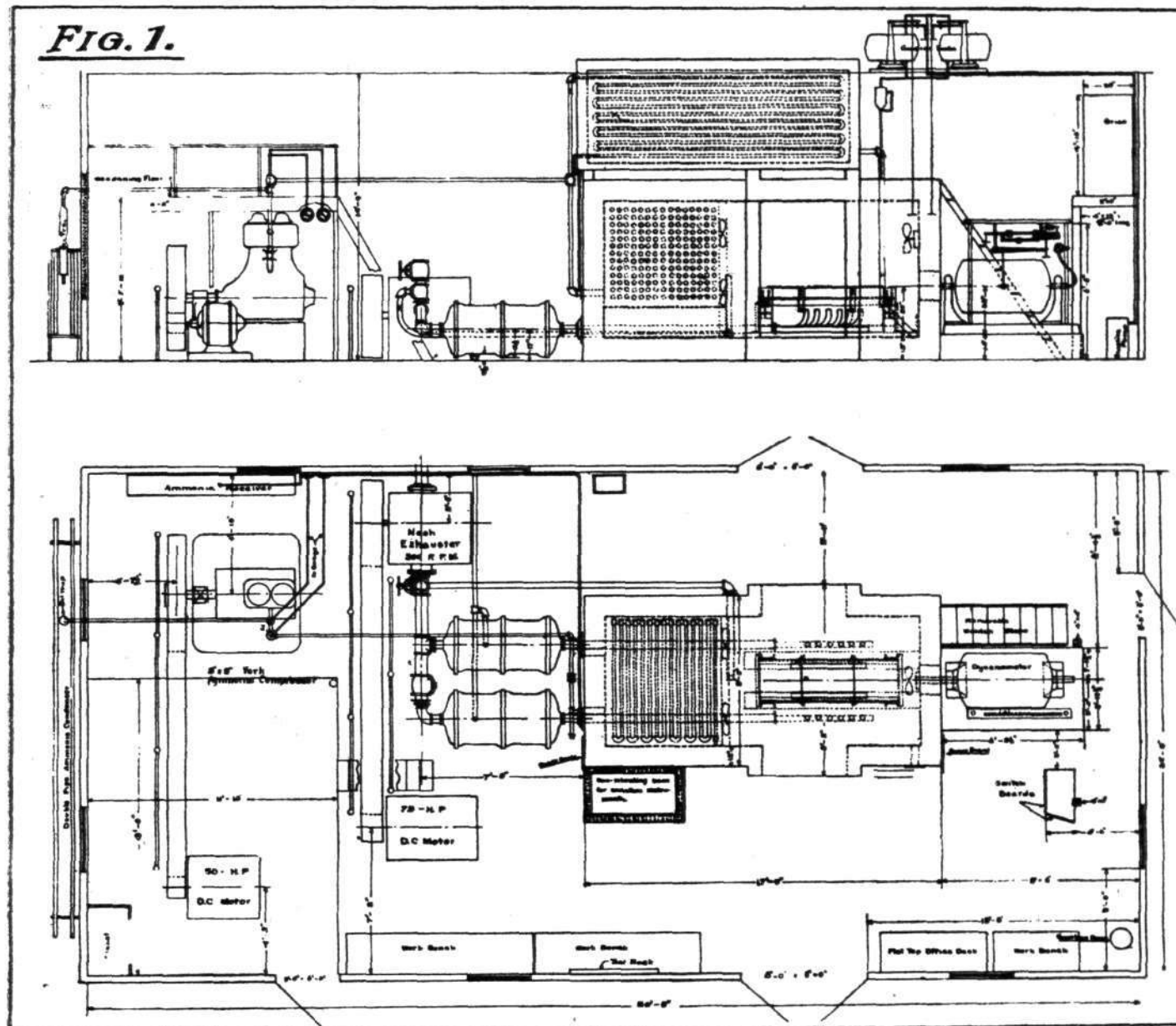
Exhaust gas samples can be withdrawn from any one of the cylinders of a twelve-cylinder engine by means of copper tubes connected to the independent exhaust manifold of each cylinder. Comparatively few exhaust gas analyses have been made up to the present time. Apparatus has been perfected and is under construction which will permit of

It will thus be seen that the conditions encountered in actual flight can be closely duplicated, while at the same time all the necessary data can be taken and easily recorded under the most favourable conditions for observation. A detailed description of the laboratory follows:—

Building

The altitude laboratory is housed at present in a temporary building of frame and stucco, having a rectangular floor plan, measuring about 24 by 50 ft. In the near future the present equipment, together with a duplicate set of apparatus, will be set up in a permanent brick and concrete structure, which is being built especially for this purpose. There are no features of the present building to call for special comment.

FIG. 1.



continuous indication of all the important constituents of the exhaust gases, but the apparatus is not yet complete.

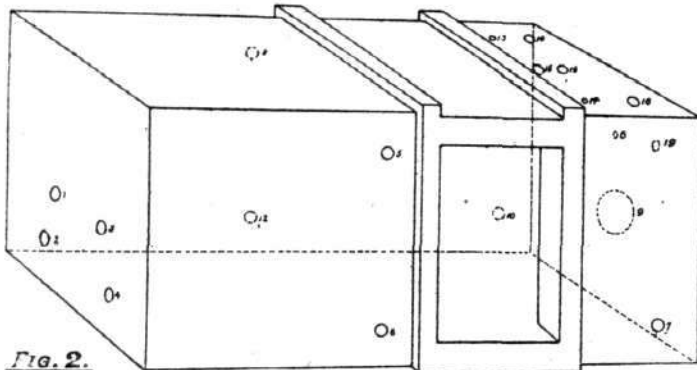
General Description of the Altitude Laboratory

Briefly, the laboratory consists of a concrete chamber, within which the engine is mounted, and from which the air may be exhausted to any pressure as low as one-third of an atmosphere, by means of a Nash centrifugal exhauster. At the same time the air is cooled to a temperature corresponding as nearly as possible to that encountered at the altitude of the test, by passing it over refrigerating coils. In the interior of the chamber electrically-driven fans are mounted which circulate the air over the coils and about the engine. As before mentioned, the power of the engine is absorbed and measured by an electric dynamometer and a water-brake mounted outside the chamber and connected to the engine through a flexible coupling. The general arrangement of the laboratory is shown in Fig. 1.

The Altitude Chamber

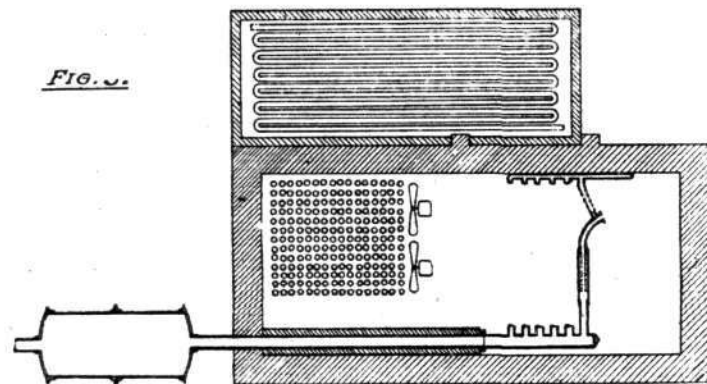
Early in the preliminary work it was decided that in order to obtain satisfactory results the engine under test would have to be surrounded by the conditions obtained during an actual flight. This necessitated the design of a test-chamber of sufficient size to accommodate the largest engine with the necessary auxiliary apparatus, such as cooling coils and fans, and with sufficient space to work around the engine for adjustments and repair. To meet these requirements a concrete chamber, 6 ft. 2 ins. wide by 15 ft. long by 6 ft. 6 ins. high, inside measurements, was constructed. The walls of the chamber are 1 ft. thick, heavily reinforced with $\frac{3}{4}$ -in. steel bars to withstand the pressure of the atmosphere outside the chamber. There are two doors opening on opposite sides of the chamber, 4 ft. by 6 ft. 6 ins. in size. The doors swing on hinges and close against heavy rubber gaskets. They are built up of 2 by 7 in. oak beams, $4\frac{1}{2}$ ft. long and

spaced 7 ins. between centres, the outside being covered with $\frac{1}{2}$ -in. soft wood loosely held with headless nails, and covered over with air-proof roofing paper. This construction was adopted to safeguard against possible explosions inside the chamber, in which case the light covering of the doors might be blown off without injury to the concrete walls. Each door contains three small glass windows through which a



view of the engine may be obtained during a test. The interior of the chamber is lined with cork for insulation, and to guard against excessive air leaks, the outside is covered with a very heavy coating of asphalt paint.

The chamber may be considered as divided into two parts; the first containing the engine, and the second the cooling coils. The engine is mounted on a special stand at the right end of the chamber as shown in Figs. 1 and 9. In order to control the engine during a test, cables are led from the spark and throttle levers, etc., through holes in the walls. The walls are also pierced for the necessary pipes and wiring, each hole being closed by a flange and gasket, through which the connections are made. A perspective view of the chamber with these openings numbered is given in Fig. 2, while a plan view is given in Fig. 3. The uses of these openings



vary somewhat with the particular type of engine being tested, but the following may be taken as typical:—

- (1) Air inlet to chamber. Controlled by a valve.
- (2) Exhaust outlet from engine. (One side of "V" motor.)
- (3) Ammonia to cooling coils in chamber.
- (4) Exhaust outlet from engine. (One side of "V" motor.)
- (5) Thermocouple leads.

More French Pilots for Russia

A MESSAGE sent out by wireless from Moscow, last week end, stated that a party of French pilots had arrived with their aeroplanes at Krasnoyarsk, in order to assist Admiral Koltchak's troops.

A Lady Airship Pilot

FROM Paris comes word that Mdlle. Gaby Morlay, the well-known actress, has passed the necessary tests to qualify her for an airship pilot's certificate. It is claimed that she is the first lady airship pilot.

Germany Wants an Aerodrome at The Hague

ACCORDING to the Rotterdam correspondent of *The Times*, many applications have been received from Germany to arrange the aviation ground which is to be established at The Hague. British firms, he points out, ought not to neglect the opportunity to compete.

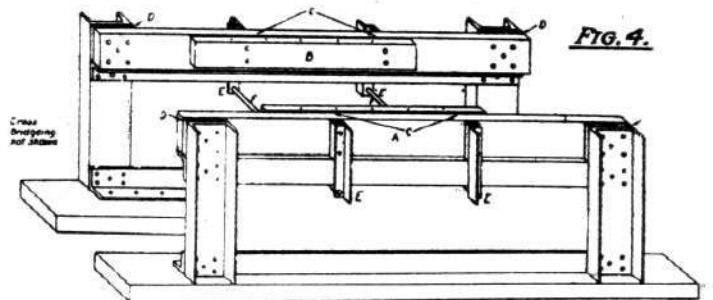
Aerial Services in East Germany

WITH reference to the restoration of express train traffic

- (6) Oil inlet, connecting oil-pressure tank outside chamber to engine sump.
- (7) Bleeder valve to admit air to chamber.
- (8) Gasoline inlet to carburettor.
- (9) Shaft connecting engine to dynamometer.
- (10) Oil cooling water pipes.
- (11) Electric light and ignition wires.
- (12) Air pipe connecting chamber to exhaustor.
- (13) Exhaust gas sampling tubes.
- (14) Exhaust cooling water inlet.
- (15) Jacket water inlet.
- (16) Jacket water outlet.
- (17) Pressure tubes to manometer board.
- (18) Carburettor air inlet.
- (19) Pressure tubes to manometer board and engine controls.

The Engine Support

The engine support was designed for the purpose of duplicating as nearly as possible the flexibility and the inertia of the typical fuselage mounting. The design developed makes possible an accurate adjustment of stiffness as regards transverse and vertical vibration and rotation about each of the three principal axes of the engine. Since no data were at hand as to the corresponding characteristics of any fuselage mountings, the support was constructed on the bases of



estimates of these constants, and appears to possess nearly the desired characteristics for the engines mounted on it up to the present time.

The design of this support is illustrated in Fig. 4. Two oak beams, A, in this case 2 by 6 ins. by 6 ft. 3 ins. long, are supported at the ends to form the basis of the mounting. The engine is mounted directly on two supplementary beams, B, of 2 by 4 in. section and of the length required for the particular engine under test. These supplementary beams are free from the main beams except at two points where they are bolted together through a thin separating block, C. Two yokes, E, are provided to prevent torsion of the individual beams, but have no other effect, as they are free from contact with any other part of the structure.

Selection of the dimensions of the main beams and adjustment of the spacing between the points of support of the secondary beams permits of adjustment of vertical and lateral stiffness and approximate adjustment of resistance about vertical and horizontal axes at right angles to the axis of the crankshaft. Stiffness as regards rotation about the latter axis can be adjusted by a third beam of proper dimensions rigidly connected at the ends and to the yoke rods, F, although the addition of this member has not been found necessary.

(To be continued.)

in East Germany, it appears from a message sent out from Berlin, that consideration is being given in Berlin to the possibility of instituting aerial routes over the territory in question in order to secure the more rapid transport of passengers and mail services.

An Italian Aeroplane Visits Berlin

FOR the first time since the beginning of the War a foreign aeroplane has landed in Berlin. The machine in question was of Italian make, and carried two Italian couriers. It had flown from Rome via Venice, Vienna, and Warsaw.

The "Bodensee's" Trip to Sweden

THE Hamburg-America Line's aerial liner "Bodensee" has completed a trip from Berlin to Stockholm and back in 17 hours.

The "Bodensee," which carried 16 passengers from Berlin, got into wireless telephone communication with the military wireless station near Stockholm from a distance of about 80 miles.

THE ROYAL AIR FORCE

London Gazette, October 2

Hampshire Aircraft Parks

Lieut. C. L. Cleburne resigns his commn.; March 9.

London Gazette, Oct. 3

Permanent Commissions

The undermentioned are granted permanent commissions in the ranks stated, with effect from Aug. 1:—Wing-Com. W. D. Beatty, O.B.E.; Squad-Ldr. B. H. N. H. Hamilton, D.S.O.; Flight-Lieut. R. D. Oxland. The initials of Flight-Lieut. P. E. Maitland are as now described and not "P. E. N.," as stated in the *Gazette* of Sept. 26.

The following temporary appointment is made:—

Staff Officer, 2nd Class (P).—Squad-Ldr. E. M. Murray, D.S.O., M.C.; (Sept. 25).

Flying Branch

Sec. Lieut. C. C. Loretto is granted the hon. rank of Lieut.; (Sept. 19, 1918).

The following relinquish their commissions on ceasing to be employed:—Sec. Lieut. J. E. H. Chadwick (Sec. Lieut., Manch. R.); (Feb. 21). Lieut. J. B. P. Phillips (Lieut., R. West Surr. R.); (Sept. 8). Lieut. R. C. Hartland-Rowe (Lieut., Leinster R.); (Sept. 12). Sec. Lieut. (Hon. Lieut.) C. E. C. Penny (Lieut., R. Fus.); (Sept. 16). Sec. Lieut. (Hon. Maj.) F. J. S. Murray (Maj., Brit. Col. R.); (Sept. 21).

(Then follow the names of 183 officers who are transf'd. to the Unemployed List under various dates.)

The following Lieuts. relinquish their commissions on account of ill-health and are permitted to retain their rank:—J. F. Hughes; (Aug. 22). C. B. H. Lefroy (contracted on active serv.); (Sept. 27). The following Lieuts. resign their commissions:—C. N. S. Ackers (Lieut., K.R.R.C.), P. W. Rutherford, M.C. (Lieut., W. Yorks R.); (Oct. 4). Sec. Lieut. J. A. Peterson relinquishes his commission on account of ill-health and is permitted to retain his rank; (Oct. 4). Sec. Lieut. D. C. Fraser is removed the service for absence without leave; (June 4). The initials of Sec. Lieut. G. C. Robinson are as now described and not "J. C.," as stated in the *Gazette* of June 28, 1918. The initials of Sec. Lieut. R. H. Taylor are as now described, and not "R. H.," as stated in the *Gazette* of July 1. The surname of Sec. Lieut. H. T. Barrett is as now described, and not "Barnett," as stated in the *Gazette* of June 24. The surname of Lieut. E. C. Burton is as now described, and not "Burton," as stated in the *Gazette* of June 24. Surname of Lieut. A. Thomson is as now described, and not "Thompson," as stated in *Gazette* July 15. Notification in *Gazette*, June 18, 1918, concerning Cadet W. F. Granger is cancelled. Notification in *Gazette*, April 18, concerning Lieut. J. J. Lancot is cancelled. Notification in *Gazette*, May 30, concerning Capt. E. R. H. Pollak, M.C., is cancelled. Notification in *Gazette*, July 25, concerning Sec. Lieut. (Hon. Lieut.) G. F. A. Lewin, M.C., is cancelled. Notification in *Gazette*, July 29, concerning Sec. Lieut. H. F. Skelton is cancelled. Notification in *Gazette*, Aug. 15, concerning Lieut. H. C. Leavers is cancelled.

Administrative Branch

Following Sec. Lieuts. are graded for purposes of pay and allowances as Capt. while employed as Capt.:—(Hon. Lieut.) W. H. Hills, (Hon. Capt.) H. Milman, O.B.E.; (to July 7). (Hon. Lieut.) S. U. Dent; (to July 28) (May 1). Sec. Lieut. G. R. Biggs is graded for purposes of pay and allowances as Capt. whilst specially employed, from (A.); (April 1). Sec. Lieut. T. Bathurst to be actg. Lieut. whilst employed as Lieut. (Oct. 10, 1918, to April 30).

Following Sec. Lieuts. are graded for purposes of pay and allowances as Lieuts. whilst employed as Lieuts.:—H. Auliff, J. E. Elliott, R. W. Stoner, T. H. Youens; (May 1). C. P. Andrews (to May 13); E. H. Hebdon-Phillips (to June 18); L. P. Kirk (to June 26). Sec. Lieut. A. H. Jones relinquishes the grading for pay and allowances as Capt. on ceasing to be employed as Capt.; (July 11). Sec. Lieuts. (A.) to be Sec. Lieuts.:—G. R. Biggs; (April 10). G. B. Demaine, H. W. F. Rendall; (April 17). Pilot Officers (A.) to be Pilot Officers:—F. G. Clarkson; (Aug. 26). J. M. Dandy; (Sept. 1). Pilot Officer P. Gent. to be Pilot Officer, from (S.O.); (Aug. 27). Sec. Lieuts. (O.) to be Sec. Lieuts.:—C. H. White; (Jan. 23). J. R. Brown; (Oct. 12). (Hon. Lieut.) W. Miller, D.F.C.; (June 12), and to be Hon. Lieut. The following relinquish their commissions on ceasing to be employed:—Lieut. E. A. Aldhelm-White (Lieut., Scots Guards); (April 17). Lieut. C. F. C. Turner (Lieut., Middlesex R.); (Sept. 12).

(Then follow the names of 33 officers who are transf'd. to the Unemployed List under various dates.)

Flying Officer N. E. S. Simon; (Oct. 1). Capt. G. Mitchell (Capt. and Qrmr., Rifle Bde.) relinquishes his commission on account of ill-health contracted on active service; (Oct. 1). Lieut. R. L. G. May (Lieut., R. Fus.) resigns his commission, and is granted rank of Capt.; (Aug. 27) (substituted for notification in the *Gazette* of Aug. 26). Sec. Lieut. (Hon. Lieut.) R. Worton relinquishes his commission on account of ill-health, and is permitted to retain the rank of Lieut.; (Sept. 25). Surname of Sec. Lieut. (Hon. Lieut.) C. A. Luce is as now described, and not "Lace," as stated in the *Gazette* of June 24. Notification in the *Gazette* of May 9 concerning Sec. Lieut. C. W. Slarke is cancelled. The notification in the *Gazette* of Aug. 29 to stand. Notification in the *Gazette* of July 8 concerning Sec. Lieut. F. C. Hilbert is cancelled.

Technical Branch

Capt. E. P. Smyth to be actg. Maj. whilst employed as Maj., Grade (A.) from Aug. 1, 1918, to Feb. 27 (substituted for the notification in the *Gazette* of Aug. 1, wherein this officer's name was described as Capt. E. P. Smith).

Following Sec. Lieuts. are graded for purposes of pay and allowances as Capt. whilst employed as Capt., Grade (A):—W. E. Townsend; (May 1). A. E. Faver; (June 1).

Following Sec. Lieuts. are graded for purposes of pay and allowances as Lieuts. whilst employed as Lieuts., Grade (A):—C. R. Brown; from Feb. 3 to July 21. A. V. Baker, C. H. Bell, J. A. Joyce, E. Taylor; (May 1).

The following Sec. Lieuts. are graded for purposes of pay and allowances as Lieuts. whilst employed as Lieuts., Grade (B):—J. Dow, from March 4 to July 21; (Hon. Capt.) F. O. Sonderby, (Hon. Lieut.) H. A. L. Way, W. Linker (to July 31); (May 1). Sec. Lieuts. relinquish the grading for pay and allowances as Capt. on ceasing to be employed as Capt., Grade (A):—E. F. Thorpe; (June 30). N. B. Hemsley; (July 10). Sec. Lieut. (Hon. Lieut.) G. F. Antell relinquishes the grading for pay and allowances as Capt. on ceasing to be employed as Capt., Grade (B); (July 21). Pilot Officer D. M. Rees relinquishes the grading for pay and allowances as Flight-Lieut. on ceasing to be employed as Flight-Lieut., Grade (A); (Sept. 29). Pilot Officer J. Sutherland relinquishes the grading for pay and allowances as Flight-Lieut. on ceasing to be employed as Flight-Lieut., Grade (B); (Sept. 22). Sec. Lieuts. relinquish the grading for pay and allowances as Lieuts. on ceasing to be employed as Lieuts. Grade (A):—C. H. N. Nunn; (May 13). T. J. E.

Thornton; (June 30). H. Williams; (July 13). Pilot Officer W. St. J. Littlewood relinquishes the grading for pay and allowances as Flying Officer on ceasing to be employed as Flying Officer, Grade (A); (Sept. 17). Pilot Officers relinquish the grading for pay and allowances as Flying Officers on ceasing to be employed as Flying Officers, Grade (B):—(Hon. Flying Officer) H. Allsebrook; (Sept. 5). R. Fell; (Sept. 8). W. Walmsley; (Sept. 13). Pilot Officer (actg. Flying Officer) C. Littlejohn relinquishes the actg. rank of Flying Officer on ceasing to be employed as Flying Officer, Grade (B); (Sept. 18). Sec. Lieuts. (Ad.) to be Sec. Lieuts., Grade (A):—A. A. M. Durrant; (April 10). (Hon. Lieut.) G. F. A. Lewin, M.C.; (July 22), and to be Hon. Lieut. H. B. Brown; (July 17) (substituted for the notification in the *Gazette* of Sept. 5). Pilot Officers (Ad.) to be Pilot Officers, Grade (B):—E. J. Newman; (Sept. 18). (Hon. Flying Officer) J. J. Galvin; (Sept. 22), and to be Hon. Flying Officer. Pilot Officer R. M. Thomas to be Pilot Officer Grade (B) from (K.B.); (Sept. 18). Sec. Lieuts. (Ad.) to be Sec. Lieuts., Grade (A):—H. J. G. Male; (Feb. 25). (Hon. Capt.) F. O. Sonderby; (May 1), and to be Hon. Capt. Sec. Lieuts. (late Gen. List, R.F.C., on prob.) are confirmed in rank as Sec. Lieuts., Grade (B):—R. A. Sibun; (April 1, 1918). T. M. O'Neill; (Aug. 17, 1918). Sec. Lieut. R. A. Sibun to be Sec. Lieut., Grade (A), from Grade (B); (June 23).

The following relinquish their commissions on ceasing to be employed:—Sec. Lieut. E. B. Flanagan; (Jan. 11). Lieut. L. R. Staddon (Warrant Shipwright, R.N.); (Sept. 11).

(Then follow the names of 41 officers who are transf'd. to the Unemployed List under various dates.)

Medical Branch

Lieut.-Col. N. H. Harris (Surgn.-Com., R.N.) relinquishes his commission on ceasing to be employed; (Sept. 19). The initials of Capt. J. I. Russell are as now described, and not "J. R.," as stated in *Gazette* of Nov. 26, 1918.

Dental Branch

Flying Officers to be Flight-Lieuts.:—A. C. S. Cottam; (Sept. 21). H. O. Salt; (Sept. 23).

Memoranda

H. W. Morgan (Capt., ret. pay, Army), late Capt. (actg. Maj.), R.A.F., is granted the rank of Maj.; (Oct. 4).

(Then follow the names of 100 Overseas Cadets who are granted temp. commissions as Sec. Lieuts. and 65 Cadets granted hon. commissions as Sec. Lieuts.)

Sec. Lieut. A. F. Cook relinquishes his commission on account of ill-health, and is permitted to retain his rank; (Aug. 13).

Royal Flying Corps.—Military Wing, Schools of Instruction

School of Military Aeronautics.—Instr. (graded as an Equip. Officer, 1st Class).

London Gazette, October 7

Flying Branch

Second Lieutenants to be Lieutenants.—(Hon. Lieut.) W. V. Tyrrell; Aug. 30, 1918. O. P. Gosling; April 13.

The following relinquish their commissions on ceasing to be employed:—Lieut. W. J. Hooke; Feb. 13 (substituted for notification in *Gazette* of April 1). Lieut. C. C. Miller (Lieut., W. Rid. R.); May 28. Lieut.-Col. R. A. Bradley, C.M.G. (Maj., N. Staffs. R.); Aug. 27. Lieut. D. B. Aitken, D.F.C. (Lieut., Sea. Highrs.); Sept. 8. Lieut. L. C. Tims (Lieut., R. War. R.); Sept. 9. Capt. C. C. Haynes (Capt., Devon. R.); Sept. 15. Capt. G. A. Turton (Lieut., Yorks. R.); Sept. 23.

(Then follow the names of 146 officers who are transf'd. to the Unemployed List under various dates.)

Capt. C. P. O. Bartlett relinquishes his commission on account of ill-health, and is granted rank of Maj.; Sept. 3 (substituted for notification in *Gazette* of Sept. 16).

Lieut. H. A. Reid relinquishes his commission on account of ill-health, and is permitted to retain his rank; Oct. 4.

Sec. Lieuts. relinquish their commissions on account of ill-health, and are permitted to retain their rank:—J. R. Johnson; May 20 (substituted for notification in *Gazette* of June 27). C. W. Savignac; July 12 (substituted for notification in *Gazette* of April 15). J. S. McGeown (contracted on active service); Sept. 28. W. Woods (contracted on active service); Sept. 29.

The initials of Sec. Lieut. J. R. D. Goadsby are as now described and not "G. R. D.," as stated in *Gazette* of Aug. 13, 1918.

The notification in *Gazette* of April 1 concerning Lieut. W. J. Hooke is cancelled.

The notification in *Gazette* of May 23 concerning Sec. Lieut. W. T. Ward is cancelled.

The notification in *Gazette* of May 30 concerning Sec. Lieut. H. B. Mills is cancelled.

The notification in *Gazette* of July 11 concerning Sec. Lieut. C. R. Abell is cancelled.

The notification in *Gazette* of Sept. 5 concerning Sec. Lieut. (Hon. Lieut.) R. Bowman is cancelled.

Administrative Branch

Sec. Lieuts. to be Lieuts.—(Hon. Capt.) A. J. Dawes (April 2, 1918); G. J. Maunsell (April 25, 1918).

R. White is granted a temp. commission as Pilot Officer; Sept. 10.

The following relinquish their commissions on ceasing to be employed:—Maj. I. A. S. Cooke, O.B.E. (Capt., Conn. Rang.); Sept. 30. Lieut. C. E. Crowne (Lieut., E. Yorks R.); Oct. 4.

(Then follow the names of 25 officers who are transf'd. to the Unemployed List under various dates.)

Lieut. (actg. Maj.) D. G. Northam relinquishes his commission on account of ill-health contracted on active service, and is permitted to retain rank of Maj.; Sept. 27.

Sec. Lieuts. relinquish their commissions on account of ill-health, and are permitted to retain their rank:—F. C. Hilbert; June 13 (substituted for notification in *Gazette* of July 15). N. B. Edwards; Aug. 7 (substituted for notification in *Gazette* of Dec. 13, 1918). H. C. Thomas; Sept. 26 (substituted for notification in *Gazette* of Aug. 1).

The notification in the *Gazette* of Sept. 5 concerning Lieut. B. Burton is cancelled.

Technical Branch

Lieut. A. G. Ridgon is graded for purposes of pay and allowances as Capt. whilst employed as Capt., Grade (A); May 1.

Sec. Lieut. R. M. Weaver to be Lieut. without pay and allowances of that rank; June 6.

Sec. Lieut. O. B. Paton to be Sec. Lieut., Grade (B), from (Ad.); Oct. 29, 1918.

The following relinquish their commissions on ceasing to be employed:—Lieut. F. R. Davis (Lieut., R.E.); Oct. 13, 1918. Sec. Lieut. (Hon. Lieut.)

G. P. Harding (Lieut., Ches. R.); Sept. 19. Capt. M. D. McFarlane (Capt., Midd'x. R.); Sept. 25.
(Then follow the names of 40 officers who are transfd. to the Unemployed List under various dates.)
Capt. (actg. Lieut.-Col.) L. B. Cook, O.B.E., relinquishes his commn. on account of ill-health contracted on active service, and is permitted to retain the rank of Lieut.-Col.; Sept. 29.
Capt. J. Stewart, O.B.E., relinquishes his commn. on account of ill-health caused by wounds, and is granted the rank of Maj.; Sept. 27.
Sec. Lieut. G. R. Rankine relinquishes his commn. on account of ill-health contracted on active service, and is permitted to retain his rank; Sept. 27.
The surname of Pilot Officer (Hon. Flying Officer) J. C. Graddon is as now described and not "Graydon," as stated in the *Gazette* of Sept. 12.
The notification in the *Gazette* of Sept. 12 concerning Sec. Lieut. A. G. Rigdon is cancelled.

Medical Branch
Flying Officer A. E. Collie to be Flight Lieut.; Sept. 28.
Flight Lieut. F. H. Wallace is transfd. to Unemployed List; Sept. 6.
(Then follow the names of 87 cadets who are granted hon. commns. as Sec. Lieuts.)
Lieut.-Col. (actg. Brig.-Gen.) J. A. Housion-Craufurd, C.M.G., C.B.E. (Lieut.-Col., retired pay) relinquishes his commn. on ceasing to be employed, and is granted hon. rank of Brig.-Gen.; June 1.
The notifications in *Gazettes* July 25 and Sept. 12 concerning Lieut.-Col. (actg. Brig.-Gen.) J. A. Housion-Craufurd, C.M.G., C.B.E., are cancelled.
Capt. R. R. L. Thom (Capt., Bedford R.) relinquishes his commn. on ceasing to be employed; Oct. 2.
Temp. Hon. Lieut. (Hon. Capt.) H. T. Wright relinquishes his commn. on ceasing to be employed; Sept. 16.
(Then follow the names of seven officers who are transfd. to the Unemployed List under various dates).

CORRESPONDENCE

R.A.F. RECORDS

[1983] May I have your permission to bring before your readers a matter of national importance? I am engaged in preparing, from official material, a history of the War in the Air. When our army took the field, in August, 1914, it was assisted by Nos. 2, 3, 4 and 5 Squadrons of the Royal Flying Corps. The value of the help given by these squadrons cannot easily be overestimated; indeed, but for the information they supplied the Germans might possibly have succeeded in surrounding and destroying the whole of our Expeditionary Force. The Royal Flying Corps were thoroughly trained for their work. From the date of the formation of the Corps, in May, 1912, down to the outbreak of War, they had been engaged in preparing themselves, by constant exercise and manœuvre, for just such a task as fell to them. Their numbers were small, but they were perhaps the most efficient and best-trained Air Force in Europe. The training was carried out at the centres—Farnborough, Netheravon, Montrose—where the squadrons were stationed, and a record of the work done was entered by the commanding officers in the squadron record books.

These record books have all disappeared. When the War broke out the commanding officers were ordered to forward their record books to the Royal Flying Corps Headquarters

at South Farnborough, and this was done. Then year followed year; the Flying Corps, as everyone knows, developed at an enormous rate; the Royal Aircraft Factory at South Farnborough grew out of all recognition; and in the growth and change of the time, the record books, packed in Renault or Gnome engine boxes, were shifted from place to place at South Farnborough. When a man is fighting for his life he has not time to spend on the relics of his infancy. Nevertheless, the record books were preserved, and when the Royal Air Force was formed, later on in the War, they were despatched from South Farnborough to the depot that was being formed at Blandford. There is evidence of their despatch, but direct first-hand evidence of their receipt is lacking, and they have not been found at Blandford.

The Royal Air Force is now rapidly being demobilised, but among past or present members of the force someone who reads this letter may remember seeing the record books and may have something to tell. Any clue to their whereabouts would be more than welcome at the Historical Branch of the Royal Air Force, 2, Cavendish Square, London, W. 1. Their importance is great. They were written by men whose names are now widely known, and whose early work did much to win for us our dominant position in the air.

WALTER RALEIGH.

CIVILIAN LANDING GROUNDS

THE Air Ministry announces that the following lists of aerodromes are issued as an addition or in amendment to the lists already published:—

LIST A.—Service Aerodromes only available for Civilian Machines in emergency.

(AMENDMENTS.)

The following aerodrome has been transferred to List E, and is now published in that list.

Aerodrome.	Nearest railway station.	Nearest large town.
Detling	Bearstead ..	Maidstone ..

LIST C.—Aerodromes temporarily retained for Service purposes (AMENDMENTS.)

The following aerodromes have been transferred to List E, and published in that list previously:—

Beverley	Beverley	Beverley
Chattis Hill	Stockbridge	Winchester
Doncaster	Doncaster	Doncaster
Killingholme	Habrough	Grimsby
London Colney	Radlett	St. Albans
Penston	Macmerry	Haddington
Seaton Carew	Seaton Carew	West Hartlepool
Shoreham	Shoreham	Shoreham-by-Sea

The following aerodromes have been transferred to List E, and are now published in that list:—

Buckminster	Witham	Grantham
Harpswell	Kirton Lindsey	Gainsborough

Poulet's False Start

On Sunday last, at 7.30 a.m., Etienne Poulet, accompanied by his mechanic Bepoit, on his Caudron, set out from Issy-les-Moulineaux on the first stage of his flight to Australia. The fog was so thick along the Seine valley that, after covering about 30 miles, Poulet deemed it prudent to return. He made a fresh start at 12.30 p.m., but had not proceeded far, however, before magneto trouble obliged him once more to land. He made a fresh start on Tuesday morning.

In Memory of Fallen French Aviators

A COMMITTEE is now at work in Paris organising a

LIST D.—Aerodromes licensed as suitable for "Avro (504 K) and similar types of aircraft" only.

Except in very few instances, accommodation does not exist. The licences have also in the majority of cases been issued for limited periods.

Aerodrome. Location of aerodrome. Nearest large town.

Gleneagles	Adjoins Station on Crieff main Glasgow-Perth railway.	
Coleford	South of Coleford Gloucester on road parallel to G.W.R. line.	
Wormwood Scrubs	South-west corner London (Hammer of Wormwood smith). Scrubs.	
West Blatchington	West of Hove Park, Brighton Brighton, at S.E. corner of West Blatchington.	

LIST E.—Stations no longer in use by the R.A.F.

These stations have been passed to the Government Property Disposal Board. They will be relinquished as soon as the Government property thereon has been disposed of. In many cases the aerodromes are now under cultivation, but it is probable that the sites still form the best emergency landing grounds in the immediate neighbourhood.

Aerodrome. Nearest railway station. Nearest large town.

Buckminster	Witham	Grantham
Detling	Bearstead	Maidstone
Harpswell	Kirton Lindsey	Gainsborough

memorial service for members of the French Air Services who fell in action. The chief service will be held in Notre Dame, and simultaneously services will be held in a Protestant church and a Jewish synagogue.

Excess Profits Duty and Engine Manufacturers

AN order of the Board of Referees relating to increase of the statutory percentage for excess profits duty appeared in the *London Gazette* of October 10 in respect of the following trade:—

Manufacture of aircraft engines.—In the case of a company increased to 9 per cent.

SIDE-WINDS

MESSRS. GILBERT CAMPLING, LTD., of 1, Albemarle Street, W 1, announce that the selling price of the A.B.C. Skootamota has been advanced to 49 guineas.

It is announced that the businesses of Brown Brothers, Ltd., London, and James Thomson and Son (Motor Factors), Ltd., Edinburgh, have amalgamated. Mr. J. Albert Thomson, chairman and managing director of the Edinburgh company, becomes one of the managing directors of Brown Brothers, Ltd., while several of the London company's directors will join the Edinburgh board.

ONE of the most important items in the engineers' spares box is a plentiful supply of gaskets for all joints. Moreover, the gaskets must be made of a reliable material tested to resist high power and withstand the action of steam, acid, oil and alkalis. A dependable joint is a great boon to engineers and those to whom this important supply counts so much, and the news that Powerite jointing is now available, will be of great interest. The proprietors of Powerite are a body of engineers whose accumulative engineering experience totals well over a hundred years. This strong combination has produced Powerite, a black sheet jointing stated to be of super-tensile strength. The company claim that Powerite shuts out all the old element of failures (that Powerite never burns out and never blows out) and embodies every possible improvement. Already some of the largest engineering firms in England have adopted Powerite. Firms who are experiencing difficulty in obtaining jointing that does not need constant renewing, should drop a line (mentioning *FLIGHT*) to the Powerite Steam Jointing Co., Ltd., 16 and 17, Devonshire Square, London, E.C., who will send a liberal sample. The proprietors have installed a large factory at Oakamoor, North Staffs, and are equipped to meet large demands at once. They will also be pleased to quote for particular kinds of washers, gaskets, for joints or bedding, on receipt of blue prints.

On Friday, October 10, Messrs. J. Samuel White and Co., East Cowes, Isle of Wight, delivered to the Navy, a new and powerful destroyer of the "W" class. She was built in the oldest shipyard on the Admiralty list, and is named the *Witherington*, a name not hitherto applied to any war vessel, but which recalls the ballad of Chevy Chase—

"Witherington needs must I wayle
As one in doleful dumps;
For when his legs were smitten off
He fought upon his stumps."

H.M.S. *Witherington* was laid down on July 29, 1918, and launched on January 16, 1919. She is of 1,450 tons displacement and 28,000 h.p., and has attained a speed of 35 knots. The *Witherington* has been constructed, engined and fully equipped by Messrs. White, and her armament consists of superimposed guns fore and aft, anti-aircraft high-angle guns and triple sets of torpedo-tubes amidships.

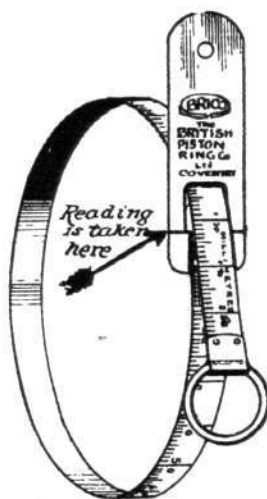
EVER extending business has caused the Lazilite Co. to seek larger premises, and they have been fortunate in securing possession of suitable accommodation next door to their present headquarters at 5, Baldwin's Gardens, Gray's Inn Road, E.C. They have installed new and up-to-date plant, which is now fully engaged on turning out the "Lazilite" devices which have proved so efficient and convenient in offices and factories. To those who are not yet acquainted with the advantages of the Lazilite fittings, the company will be pleased to send full particulars.

M. ALFRED LEBLANC has been elected President of the Chambre Syndicale des Industries Aéronautiques for the coming year, while the Vice-Presidents are MM. Louis

Bréguet, Henry Kapferer, Fernand Lioré, Luquet de St. Germain.

DURING the War the list of records achieved by the aid of Claudel-Hobson carburettors could not be added to to any considerable extent, although up to the time of the Armistice we believe the list included all records for height, speed, lifting and duration. Since then the Claudel-Hobson carburettor has played a worthy part in a number of outstanding performances, including the Transatlantic flight of Sir John Alcock on the Rolls-Vickers-Vimy, the double journey of the Sunbeam-engined R 34, the London-Madrid flight of the Alliance-Napier machine, the Aerial Derby (in which machines fitted with Claudel-Hobsons finished first, second and third). Also the regular running of the Airco machines between London and Paris during the past seven weeks is incidentally an excellent testimonial to the efficiency of these famous carburettors.

AN ingenious device for measuring the external or cylinder diameter of piston rings has just been placed on the market by the British Piston Ring Co., Ltd., makers of Brico piston rings, Holbrook Lane, Coventry. The Brico Piston Ring Meter, as the makers call it, is a band of flexible steel graduated in millimetres from 50 to 150. One end of the tape is broad and has a slot through which the graduated part slips. An indicating point at the side of slot makes the reading point. To use the tape one end is screwed to the table, bench or other convenient point, a screw and washer being provided for this purpose. The piston ring to be measured is simply inserted in the loop of the tape, taking care to have the gap of the ring in a position where it can be seen. The tape is then pulled tight by means of finger ring until the gap of piston is closed, the diameter being seen at the slot indicated in illustration. The whole operation takes but a few seconds, and gives accurate results. The piston ring meter is sold complete in box at 7s. 6d. and a liberal discount is given to the trade. At present samples are sent to the trade at 5s. 6d. each, post free. Anyone who measures piston rings will find this a most useful tool.



The Brico Piston Ring Meter

THE two-seater D.H.4 with Rolls-Royce engine which Messrs. S. Instone and Co., shipowners, of Billiter Street, E.C., and Cardiff, have added to their equipment, commenced its regular work on Monday, when it flew from Cardiff to London in 56 minutes, bringing a parcel of letters, etc. About an hour later, Lieut. Barnard, the pilot, left for Paris with letters and parcels, and landed safely 1 hour 55 minutes later at Le Bourget, near Paris.

The aeroplane flew Messrs. Instone's house flag.

ONE exhibit which never fails to attract will be missing from the forthcoming Motor Car Show at Olympia. Lack of floor space precludes Palmer Tyre, Ltd., from showing the wonderful cord-laying machine at work building-up the fabric which plays such an important part in the longevity and efficiency of these famous tyres. The company will, however, have on view a full range of their covers, tubes and other tyre specialities, and visitors will, therefore, find much to interest, even if they are deprived of the fascination of seeing the wheels go round.

B.A.T. Trips Abroad

ON Tuesday, October 7, the British Aerial Transport Co. despatched a saloon passenger machine, piloted by Mr. Cyril Turner, to Amsterdam. This machine carried a quantity of merchandise, and returned from Holland on Friday afternoon, 10th instant, with the full complement of passengers. On Friday morning, 10th instant, Maj. C. Draper, D.S.C., left Hounslow piloting a saloon passenger machine of the

British Aerial Transport Co. for Paris, completing the journey in 2 hours 20 minutes. This machine was specially chartered, the passengers being Sir Percival Perry, Col. Warwick Wright, D.S.O., Maj. Lennard and Mr. Van den Bergh. On Tuesday morning, October 14, the British Aerial Transport Co., Ltd., despatched a passenger saloon machine to Amsterdam from Hounslow, piloted by Mr. C. Turner. Passengers and merchandise were carried, and it is proposed to make the service a weekly one.

LONDON-PARIS AIR SERVICES

HAVING flown just on 25,000 miles with passengers and parcels, the Aircro London-Paris aeroplanes completed, last Saturday, their first seven weeks of continuous operation.

"As the commercial future of flying depends mainly upon reliability," said Mr. Holt Thomas, "I consider it very significant that, in our first 42 days' flying, during which 30 were unfavourable climatically, we should have been able, as we have, to reach a percentage of reliability as high as 97. That the aeroplane is still an unreliable vehicle cannot be argued in face of the fact that, during these seven weeks of daily flying, we should have had to record only one forced landing through any mechanical defect. As speed is the essence of aerial transport, I myself consider it specially significant that, in weather which rarely favoured us, we should have been able to obtain an average air speed throughout as high as 100 miles an hour.

"Each day, now, our organisation improves. Our passengers, who are booking seats as far as a month ahead, are now picked up by motor car at any point within a mile of Piccadilly Circus, and taken out to Hounslow in time for the departure of the 12.30 p.m. air express; while, on arrival at Le Bourget, at 2.45 p.m., they are immediately driven into Paris. It is not only by far the quickest, but also the simplest, way of travelling. You have one ticket, one vehicle; you avoid hosts of irritating delays. The business man in a hurry saves more than four hours on the journey in actual time; and, assuming he writes down the value of his time at only a few pounds an hour, the difference between our 20-guinea air-fare and that of the ordinary land and sea route is not merely not an extravagance; it is a sound business proposition."

During the first five weeks of their London-Paris service, up to October 4, the Handley Page Transport, Ltd., accomplished 15 flights each way, and carried a total of 219 passengers and approximately 6,000 lb. of freight. With regard to their Brussels service, which has been in operation for a shorter period, nine trips each way have been made in a fortnight, and the number of passengers carried averaged six per flight. On four consecutive days during the railway strike the company carried mails. The average time occupied in taking the mails across Channel was 2½ hours.

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COMPANY MATTERS

Boulton and Paul, Ltd.

THE directors of Boulton and Paul, Ltd., announce a dividend of 12½ per cent. (2s. 6d. per share), free of income-tax, on the ordinary shares for the year, carrying £5,984 forward, after providing for depreciation and War taxation, writing off the item of goodwill, and raising the general reserve to £20,000.

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PUBLICATIONS RECEIVED

- General Theory of Blade Screws* (Report No. 29).
- Self-Luminous Materials* (Report No. 33).
- Aluminium and its Light Alloys* (Report No. 34).
- Fabric Fastenings* (Report No. 37).
- Airplane Dopes and Doping* (Report No. 38).
- Testing of Balloon Fabrics* (Report No. 39). The National Advisory Committee for Aeronautics, 4th Street and Missouri Avenue N.W., Washington, D.C., U.S.A.
- Aeroplane Structures*. By A. J. Sutton Pippard, M.B.E., M.Sc., and Capt. J. L. Pritchard, late R.A.F. London: Longmans, Green and Co. Price 21s. net.
- Aircraft in Peace and War*. By Sir John Foster-Fraser, F.R.G.S. Blackburn Aeroplane and Motor Co., Ltd., Leeds.
- Handbook of Modern Aeronautics*. London: The Library Press, Ltd., 26, Portugal Street, Kingsway.
- Through Lapland with Skis and Reindeer*. By Frank Hedges Butler, F.R.G.S. London: T. Fisher Unwin, 1, Adelphi Terrace, W.C.
- Aeroplane Timbers*. By Gilbert R. Keen. London: William Rider and Son, Ltd., 8-11, Paternoster Row. Price 6s. net.
- The Aviation Catechism*. By Major W. T. Blake, R.A.F. London: Nisbet and Co., Ltd., 22, Berners Street, W. Price 1s. 6d. net.
- Airplane Design and Construction*. By O. Pomilio. London: Hill Publishing Co., Ltd., 6-8, Bouverie Street. Price 25s. net.
- Reminders for Company Secretaries*. By H. W. Jordan. London: Jordan and Sons, Ltd., 116, Chancery Lane. Price 9d. net., postage 2d.
- Private Companies: Their Utility and the Exemptions They Enjoy*. By H. W. Jordan. London: Jordan and Sons, Ltd., 116, Chancery Lane. Price 1s. net.; post free 1s. 4d.

IMPORTS AND EXPORTS, 1918-1919.

AEROPLANES, airships, balloons and parts thereof (not shown separately before 1910). For 1910 and 1911 figures see "FLIGHT" for January 25, 1912; for 1912 and 1913, see "FLIGHT" for January 17, 1914; for 1914, see "FLIGHT" for January 15, 1915; for 1915, see "FLIGHT" for January 13, 1916; for 1916, see "FLIGHT" for January 11, 1917; for 1917, see "FLIGHT" for January 24, 1918; and for 1918, see "FLIGHT" for January 16, 1919.

	Imports.		Exports.		Re-Exportation.	
	1918.	1919.	1918.	1919.	1918.	1919.
January ...	49,402	555,989	24,765	57,571	—	—
February ...	51,941	453,822	13,545	57,972	—	—
March ...	47,930	704,424	11,451	72,716	1,000	400
April ...	33,342	97,662	10,815	25,433	—	—
May ...	942,866	136,631	67,224	38,428	—	—
June ...	864,296	1,410	35,658	41,526	—	—
August ...	566,137	67,292	71,503	60,581	—	—
September ...	505,160	172,192	8,033	65,349	100	—
	4,895,367	2,325,885	253,794	460,866	1,000	400

AERONAUTICAL SPECIFICATIONS PUBLISHED

Abbreviations:—cyl.=cylinder; I.C.=internal combustion; m.=motors.

APPLIED FOR IN 1916

The numbers in brackets are those under which the Specifications will be printed and abridged, etc.

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